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**Attachment, reflective functioning and
emotion regulation as predictors of
proneness to develop bipolar disorder**

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**PhD
The University of Edinburgh
2014**

Declaration

I declare that this thesis is my own work and has not been submitted for any other degree or professional qualification.

Sonia Madrid-Cuevas

Date

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“One ought to hold on to one's heart; for if one lets it go, one soon loses control of the head too.”

Friedrich Nietzsche

“I don't want to be at the mercy of my emotions. I want to use them, to enjoy them, and to dominate them.”

Oscar Wilde

Abstract

Background

Within the context of developmental psychopathology and the psychological factors associated with the onset of severe mood instability, this thesis proposes that early attachment related interactions underlie the development of reflective functioning and effective emotional regulation necessary for optimal functioning. Both insecure attachment and poor reflective functioning have been linked to various mental disorders in which emotion dysregulation surfaces as a core feature. However, the underlying mechanisms by which these constructs interact to predict increased risk to develop bipolar disorder have yet to be considered.

Objectives

This project's objectives were to investigate, through a quantitative cross sectional design, the following questions: 1) In what way are attachment, reflective function and emotion regulation associated with proneness to bipolar disorder? 2) Do reflective functioning, emotion regulation, depression and specific metacognitive patterns mediate the influence of attachment on increased likelihood of developing bipolar disorder?

Method

An online survey was used to ask 2325 participants to complete questionnaires measuring the variables of hypomanic traits, attachment relationship style, mood, emotion regulation, metacognitive patterns and reflective functioning. The survey was designed to give participants feedback immediately after entry completion, which proved to be a very successful recruitment strategy. For the analysis of the data, structural equation modeling (SEM), multivariate and univariate statistics were used.

Results

SEM analysis demonstrated that internal dysfunctional emotion regulation is the strongest predictor of bipolar disorder proneness, whilst anxious insecure attachment holds a strong direct relationship with internal dysfunctional emotion regulation not mediated by reflective functioning. Thus, anxious insecure attachment and reflective functioning emerged as indirect predictors to bipolar proneness, being fully mediated by internal dysfunctional emotion regulation strategies, depressive symptoms, perceived well being and negative metacognitive patterns. The use of dysfunctional emotion regulation strategies directly predicted low mood and indirectly predicted decreased well being and increased risk to develop bipolar disorder. Furthermore, in this sample the presence of hypomanic traits alone did not imply proneness to bipolar disorder, but it was the combination of hypomanic traits and depressive symptoms that best predicted increased likelihood of experiencing bipolar disorder.

Discussion

The results highlight the importance of investigating the underlying mechanisms of severe mood instability. The findings support the manic defense hypothesis, which suggests that manic symptoms emerge to offset underlying depressive mood. It was concluded that severe mood instability emerges and is maintained because of the influence of developmental interpersonal risk factors such as anxious insecure attachment. The latter fosters dysfunctional cognitive features that promote the use of maladaptive emotion regulation strategies, which in turn give rise to depressive mood, diminished well being and ultimately increased risk to develop bipolar disorder. Thus, to better understand and treat bipolar disorder it is important to focus on tackling these psychological aspects of the disorder.

Table of contents

Section 1: Introduction - A developmental perspective on bipolar disorder in the light of attachment theory, reflective functioning and emotion regulation

Introduction.....	2
1.1 Bipolar Disorder	7
1.1.1 Definition	7
1.1.2 Bipolar mood episodes	8
1.1.3 Bipolar disorders diagnosis.....	9
1.1.4 Age of onset and prevalence rates for bipolar disorder	10
1.1.5 Course of bipolar disorder	11
1.1.6 Suicide in bipolar disorder.....	12
1.1.7 Aetiology and treatments for bipolar disorder.....	13
1.2 Attachment.....	15
1.2.1 Attachment theory, its development and evolution	15
1.2.2 Measures of adult attachment	23
1.2.2.1 The Adult Attachment Interview	23
1.2.2.2 Self-Report Measures	24
1.2.3 Attachment and psychopathology.....	27
1.3 Emotion Regulation	30
1.3.1 Definition of emotion regulation	30
1.3.2 Development of emotion regulation	32
1.3.3 Emotion regulation and psychopathology	34
1.4 Reflective functioning	40
1.4.1 Definition of reflective functioning	40
1.4.2 Acquisition of reflective functioning.....	43
1.4.3 Reflective functioning and psychopathology	47
1.5 Metacognition	54
1.5.1 Definition of metacognition.....	55
1.5.2 Metacognition and psychopathology	55
1.6 Risk factors for developing bipolar disorder	59
1.6.1 Environmental risk factors for bipolar disorder.....	59
1.6.1.1 Life events and social support in bipolar disorder.....	60
1.6.2 Psychological risk factors for bipolar disorder.....	68

1.6.2.1 Cognitive biases and personality traits in bipolar disorder	68
1.6.3 Developmental risk factors for bipolar disorder	78
1.6.3.1 Attachment organization, reflective functioning and emotion regulation in bipolar disorder	79
1.7 Aims of the Study and Research questions.....	95
1.8 General conclusions from the literature review	97

Section 2: The RF Pilot Study - Development and validation of an Automated Measure of Reflective Functioning

Introduction.....	99
2.1 The reflective functioning scale (RF)	100
2.1.1 Advantages and disadvantages of the RF scale	101
2.2 The computerized reflective functioning measure (CRF)	103
2.2.1 Development of the CRF	104
2.3 The automation of the assessment of RF	107
2.3.1 Hypothesis	108
2.3.2 Methodology.....	109
2.3.2.1 Design	109
2.3.2.2 Ethical approval	110
2.3.2.3 Participants	110
2.3.2.4 Measures	111
2.3.2.5 Procedure	113
2.3.2.6 Data analysis.....	115
2.3.3 Results.....	116
2.3.4 Discussion.....	120
2.4 Conclusions.....	125
2.5 Implications for this thesis.....	125

Section 3: Main study's design and methodology

Introduction.....	127
3.1 Hypothesis	127
3.2 Method	128
3.2.1 Design overview	128
3.2.2 Ethical Approval.....	129
3.2.3 Recruitment.....	130

3.2.3.1 Sample size and power calculations	130
3.2.3.2 Online Recruitment.....	131
3.2.3.3 The Survey System Design and Dissemination.....	135
3.2.4 Materials	140
3.2.4.1 The Hypomanic Personality Scale (HPS	140
3.2.4.2 The Internal State Scale (ISS	141
3.2.4.3 The Relationship Scale Questionnaire (RSQ.....	143
3.2.4.4 The Beck Depression Inventory (BDI-II	145
3.2.4.5 The Metacognition Questionnaire (MCQ-30.....	146
3.2.4.6 The Regulation of Emotions Questionnaire (REQ	148
3.2.4.7 The Reflective Functioning Automated Measure (RF.....	149
3.2.5 Procedure	150
3.2.6 Data analysis.....	151

Section 4: Statistical analysis and Results

Introduction.....	153
4.1 Descriptive Statistics	153
4.1.1 Sample's Demographics	153
4.1.1.1 Motivation to complete the survey	156
4.1.1.2 Summary of sample's demographic characteristics	157
4.1.2 Mental Health Sample's Characteristics.....	157
4.1.2.1 Summary of sample's mental health characteristics.....	159
4.2 Measures of central tendency and mean group comparisons	159
4.2.1 The Hypomanic Personality Scale (HPS	160
4.2.2 The Internal State Scale (ISS	162
4.2.3 The Relationship Scale Questionnaire (RSQ.....	167
4.2.4 The Beck Depression Inventory (BDI	173
4.2.5 The Metacognitions Questionnaire (MCQ-30	176
4.2.6 The Regulation of Emotions Questionnaire (REQ	183
4.2.7 Reflective Functioning (RF	187
4.2.8 Summary of group comparisons.....	189
4.3 Structural Equation Modelling analysis (SEM	195
4.3.1 Overview.....	195
4.3.2 The measurement model (CFA.....	197
4.3.3 Overall fit of the measurement model (CFA).....	199

4.3.4 Hypotheses testing with SEM.....	201
4.3.4.1 Model 1	202
4.3.4.2 Model 2	203
4.3.4.3 Model 3	205
4.3.4.4 Model 4	207
4.4 Cluster and Discriminant Analysis	217
4.4.1 Two-step cluster analysis.....	218
4.4.2 Discriminant analysis.....	219
4.5 Conclusions.....	224
 <i>Section 5: Discussion – The implications of a developmental perspective on vulnerability to bipolar disorder</i>	
Introduction.....	227
5.1 Psychological risk factors for developing bipolar disorder	227
5.1.1 Insecure attachment as a predictor of dysfunctional emotion regulation and reflective functioning.....	228
5.1.2 Insecure attachment as a risk factor for proneness to bipolar disorder.....	230
5.1.3 Reflective functioning as a mediator of insecure attachment and dysfunctional emotion regulation	235
5.1.4 Reflective functioning as a risk factor for proneness to bipolar disorder.....	236
5.1.5 Dysfunctional emotion regulation as a risk factor for proneness to bipolar disorder.....	239
5.1.6 Depression and negative metacognitions as risk factors for proneness to bipolar disorder	242
5.2 The impact of demographic variables on proneness to bipolar disorder	244
5.3 Clinical implications	247
5.4 Theoretical implications	249
5.5 Limitations and suggestions for future research	250
5.6 Conclusions.....	251
 <i>References</i>	253
 <i>Appendices</i>	271

Tables

Table 2.1 Demographics of Pilot Study participants	119
Table 2.2 Correlations of Pilot Study data.....	119
Table 4.1 HPS means by groups.....	162
Table 4.2 ISS subscales mean scores by group	167
Table 4.3 Oblique Rotation Solution for the RSQ.....	169
Table 4.4 Final Solution for the RSQ	170
Table 4.5 RSQ subscales mean scores by group	173
Table 4.6 BDI means by groups	175
Table 4.7 MCQ total and subscales mean scores by group	182
Table 4.8 REQ subscales mean scores by group	187
Table 4.9 RF mean score by group	189
Table 4.10 Statistically significant mean differences and effect size by group.....	192
Table 4.11 Statistically significant mean differences and effect size by group, after Bonferroni's correction.....	194
Table 4.12 Oblique Rotation Solution for the HPS	198
Table 4.13 Final Solution for the HPS.....	199
Table 4.14 Chi-Square Comparisons of the Multigroup SEM analysis	211
Table 4.15 Indirect effects that are different across gender.....	216
Table 4.16 Indirect effects that are different across age groups	216
Table 4.17 Indirect effects that are different across diagnosis groups	216
Table 4.18 Significant discriminant functions.....	220
Table 4.19 Identified discriminant functions.....	221
Table 4.20 Structure Matrix of the Discriminant Analysis Functions.....	221
Table 4.21 Canonical discriminant functions evaluated at group means	223
Table 4.22 Having a BD diagnosis based on HPS and BDI scores.....	224
Table 5.1 Hypotheses testing results	252

Figures

Figure 1.1 Two-dimensional four-category model of adult attachment	25
Figure 1.2 A-priori postulated conceptual model of vulnerability to bipolar disorder	97
Figure 2.1 Diagrammatic representation of the pilot study's methodology	115
Figure 3.1 Diagrammatic representation of the main study's methodology	152
Figure 4.1 Structural equation model of developmental aspects as predictors of low and high mood	203
Figure 4.2 Structural equation model of developmental aspects as predictors of low and high mood, and well being.....	205
Figure 4.3 Structural equation model of developmental aspects as predictors of low and high mood, and negative metacognitive beliefs around the need to control one's thoughts	207
Figure 4.4 Structural equation model of developmental aspects as predictors of low and high mood, well being and negative metacognitive beliefs around the need to control one's thoughts.....	209
Figure 4.5 Structural equation model of bipolar risk in males and females	212
Figure 4.6 Structural equation model of bipolar risk in three age groups	213
Figure 4.7 Structural equation model of bipolar risk in three diagnostic status derived groups..	214

Charts

Chart 4.1 Participants' Gender distribution	155
Chart 4.2 Number of participants per age range	155
Chart 4.3 Number of participants per ethnic group	155
Chart 4.4 Participants' Marital Status	155
Chart 4.5 Participants' Employment Status	155
Chart 4.6 Participants' Education Level	155
Chart 4.7 Participants motivation to complete the survey	157
Chart 4.8 Participants who sought help for emotional problems	158
Chart 4.9 Participants' report of motives for which they have sought help	158
Chart 4.10 Participants who take prescribed medication	158
Chart 4.11 Participants' report of prescription medication	158
Chart 4.12 Participants who have a mental health diagnosis	159
Chart 4.13 Participants' report of mental health diagnosis	159
Chart 4.14 Groups resultant from cluster analysis	218

Appendices

Appendix 1 – Ethical Approval for the Pilot Study.....	272
Appendix 2 – Ethical Approval for the main Large Study.....	273
Appendix 3 – The landing (front) page of the online survey	274
Appendix 4 – The information sheet (as it appears in the online survey	274
Appendix 5 – The consent form (as it appears in the online survey.....	275
Appendix 6 – Example of feedback for participants after survey completion	275
Appendix 7 – List of websites and blogs contacted to disseminate the study	277
Appendix 8 – The end page of the online survey	277
Appendix 9 – Distribution of the data	278
Appendix 10 – Measures	288
Appendix 11 – Consent form, information sheet and demographics form used in the RF pilot study.....	301
Appendix 12 – Examples on how to score and classify RF	303
Appendix 13 – Demographic questions for the main study	304

Section 1

*Introduction: A developmental perspective of
bipolar disorder in the light of attachment theory,
reflective functioning and emotion regulation*

Section 1

Literature Review

Introduction

Bipolar disorder (BD) and the accompanying emotional instability constitute a highly compromising condition characterized by high relapse rates that substantially impact both the individual and society, given the impaired occupational functioning that often results from being afflicted with severe mood instability. Furthermore, long delays between onset and appropriate recognition, diagnosis and treatment unfortunately still prevail. Thus, more research into early identification of sensitive and specific risk factors for bipolar disorder is crucial.

Not too long ago bipolar disorder was still considered a relatively rare condition, but more recently it has been estimated that about 1% of the world population suffer from severe mood instability (Maj et al., 2000). Moreover, the current tendency to consider the disorder in terms of a “bipolar spectrum” has resulted in a dramatic increase of its prevalence rates. Some researchers have suggested that it is up to 2.8% and 6.5% of the population who suffer from BD when considered within a spectrum (Bauer & Pfenning, 2005; De Lima et al., 2005).

Bipolar disorder is considered one of the most severe psychiatric disorders at any age, and is amongst the most disabling of psychiatric conditions (Johnson et al., 2007; WHO, 2002). Due to high rates of misdiagnosis, delayed diagnosis, and lack

of recognition and treatment of comorbid conditions, patients with bipolar illness often experience a recurrent course characterized by high disability, unemployment rates, and mortality associated with suicide (Leboyer & Kupfer, 2010; Bauer & Pfennig, 2005). Moreover, acute manic episodes have a severe impact on employment related activity, prolonging occupational dysfunction which often impacts on relationships' quality, leading to further problems such as separation and divorce (Reed et al., 2010).

For many years bipolar disorder has been described as a mainly biological disorder that is generally treated with pharmacotherapy. But, as undeniably relevant as genetic and biological vulnerabilities are, these should not be the only way to understand the aetiology of bipolar disorder, since they cannot fully explain individual differences in the expression, course and associated symptomatology of the disorder (Miklowitz & Alloy, 1999).

Furthermore, due to the overlap between bipolar experiences and normal life, it is difficult to separate normal from problematic mood dysregulation. Thus, labelling people's experiences by using a diagnostic nomenclature is not in itself beneficial, it is also important to consider experiences individually and not to rush into diagnosing without accounting for variability of experience of what constitutes a problem in someone's life (Jones et al., 2010; Bracken et al., 2012). Considering the context can provide an insight to the great unknowns in relation to the contributing factors that influence problematic emotion dysregulation in bipolar disorder.

More recently psychopathology researchers have shown more interest in identifying both risk and protective factors in relation to the onset and course of bipolar disorder. Developmental psychologists have identified a link between early childhood experiences and emotion regulation which suggests that dysfunctional regulation of emotion account for higher risk of developing mental health disorders (Fonagy & Target, 2002), including bipolar disorder (Schwannauer, Noble & Fraser, 2011). From this perspective, it is during early attachment related experiences that an individual's ability to self-regulate is founded. Affect regulation, which encompasses emotion regulation, is then a developmental achievement that stems from the quality of early attachment interactions and it accounts for a long-term outcome of early relationships (Fonagy & Target, 2002).

Early human experiences, as understood within the framework of attachment theory, can play a crucial role in developing healthy and functional emotion regulation strategies and thus play an intrinsic role in the appearance of psychopathology, such as bipolar disorder. More specifically, insecure attachment, emerging as a consequence of a carer's unavailability and lack of empathy, can be considered a vulnerability to mental health problems in later life (Mikulincer & Shaver 2012).

Attachment theory has been an extremely useful framework of understanding emotional disturbances in children. Based on the evidence that research in this area yields it is now well known that early interactions between infant and caregiver have a fundamental impact on an infant's emotional development (Alloy et al., 2005; Fonagy et al., 1996). Childhood experiences that are characterized by interactions

with inconsistent attachment figures hinder the emergence of a secure, stable mental representation of the self and other, and thus promote the establishment of insecure patterns of attachment that increase vulnerability to psychopathology (Bowlby, 1988), whilst reflective function serves as a mediator between attachment experiences and outcomes (Fonagy & Target, 2002).

Reflective functioning is the operationalized denomination of mentalization. The latter being the human capacity to attempt to understand one's thoughts and those of others. This capacity allows human experiences to become meaningful by deepening the understanding of intentions, feelings, thoughts, desires and beliefs of the self and others. This process whereby subjective experience is understood is considered crucial to affect regulation (Fonagy & Target, 1997). Mentalization emerges within the primary caregiver and infant dyad relationship. By having the experience of being cared for by a responsive and available parent, the child will begin to develop the capacity to make sense of his internal experience, thus to mentalize. An attuned caregiver will provide the child with the experience of being understood as a separate being with desires, feelings, thoughts and wishes of his own (Slade, 2005).

Reflective functioning (RF) has often been compared to constructs such as metacognition and theory of mind. The three concepts are frequently used interchangeably since they fundamentally refer to the same underlying mechanisms that allow the human mind to understand itself and that of others. They are linked developmentally but each construct was first defined following a different theoretical background. Thus, in this first section of the thesis, I will briefly cover the concept of

metacognition along with RF.

The features of bipolar disorder pose inherent and constant challenges for researches and clinicians. In spite of all the efforts to better understand and treat this disorder, the nature of the link between developmental factors and the impaired capacity to regulate emotion, observed in bipolar disorder, remains unclear. Moreover, although difficulty with affect regulation, and thus maladaptive emotional responses, is considered a core component of bipolar disorder, little research has focused on the nature of this within the disorder (Johnson, Gruber & Eisner, 2007), and thus there is still a lack of theoretical models which can adequately account for the key psychological aspects of bipolar disorder (Power, 2005).

Thus, in the first section of this thesis I will introduce the reader to the concepts of bipolar disorder, attachment, reflective functioning and emotion regulation attempting to effectively link the constructs and clearly present the picture of what constitutes the state of vulnerability to develop bipolar disorder based on these developmental predictors. To do so I have reviewed the relevant literature both in books and empirical evidence papers. Finally, at the end of this section, the reader will be presented with the research questions and aims of the study.

1.1 Bipolar Disorder

1.1.1 Definition

Bipolar disorder is generally defined as a chronic mental illness characterized by the presence of two phases: a manic phase and a depressive phase (Torpy et al., 2009). For a diagnosis of bipolar to be appropriate, instead of that of a depressive disorder, at least one manic or mixed episode is needed. Bipolar disorder is considered a cyclic mood disorder that presents constant or irregular alternate episodes of mania/hypomania with euthymic/depressive episodes (Vieta, 2005).

According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; *DSM-5*; American Psychiatric Association, 2013), there are three different types of bipolar episodes; manic, hypomanic and depressive, whilst each of these can be experienced with mixed features, that is with both depressive and manic symptoms being present simultaneously. Based on the severity, frequency and probable cause of the episodes, bipolar disorder diagnosis can be divided in the following subcategories: bipolar I, bipolar II, cyclothymic disorder, substance/medication induced bipolar and related disorder, bipolar and related disorder due to another medical condition, other specified bipolar and related disorder and unspecified bipolar and related disorder.

1.1.2 Bipolar mood episodes

The presence of manic episodes is what primarily distinguishes bipolar disorder from depressive disorders. Bipolar mania is defined by a period of abnormally and persistently elevated, expansive or irritable mood and abnormally and persistently goal-directed activity that lasts for at least one week. The main symptoms of mania are heightened mood, flight of ideas, pressure of speech, increased energy, decreased need for sleep, and hyperactivity. In general, these symptoms are present in all stages of a manic episode, although its severity fluctuates. Core symptoms are certainly present during hypomania and acute mania, although they aggravate during the latter and are sometimes combined with delusions and fragmented behaviour, plus other psychotic symptoms. On the whole, most patients with a diagnosis of bipolar disorder that experience a hypomanic period will progress to acute mania (5th ed.; *DSM-5*; American Psychiatric Association, 2013).

Depressive episodes in bipolar disorder often include the reverse signs from those present during acute mania, such as hypersomnolence, apathy and lack of energy (Vieta, 2005). Bipolar depression differs from depressive disorders in that symptoms unveil severely over a short period of time and for no apparent reason. The core symptomatology displayed during these episodes includes psychomotor retardation, increased appetite and quite frequently delusions and hallucinations (Smith & Craddock, 2011; 5th ed.; *DSM-5*; American Psychiatric Association, 2013).

Lastly, hypomanic episodes are characterized by continuous elevated mood and

increased activity or energy, that persist for at least 4 days, in combination with symptoms such as exaggerated self-esteem, decreased need for sleep, overly assertive and rapid speech, racing thoughts, increased involvement in pleasurable activities that have a high potential for negative consequences and greater involvement in social or work related activities (5th ed.; *DSM-5*; American Psychiatric Association, 2013).

1.1.3 Bipolar disorders diagnosis

According to the diagnostic manual (American Psychiatric Association [APA], 2013), the bipolar spectrum can be divided into several categories, bipolar I, bipolar II, cyclothymic disorder, substance/medication induced bipolar and related disorder, bipolar and related disorder due to another medical condition, other specified bipolar and related disorder and unspecified bipolar and related disorder. This classification distinguishes between severity, probable cause and frequency of symptomatology.

Bipolar I and II differ in that during the latter patients do not experience episodes of acute mania but only ones of hypomania. In Bipolar I patients experience one or more manic episodes along with depressive episodes, whilst in Bipolar II major depressive episodes are accompanied by at least one hypomanic episode (5th ed.; *DSM-5*; American Psychiatric Association, 2013).

Cyclothymic disorder is characterized by the presence of numerous periods of hypomanic symptoms and of depressive symptoms that do not meet criteria for a

diagnosis of either manic or major depressive episodes (5th ed.; *DSM-5*; American Psychiatric Association, 2013).

Lastly, the most recent edition of the mental disorders diagnostic manual (APA, 2013) includes four other diagnostic categories (substance/medication induced bipolar and related disorder, bipolar and related disorder due to another medical condition, other specified bipolar and related disorder and unspecified bipolar and related disorder) to account for patients who exhibit bipolar symptoms due to substance or medication use/abuse, patients experiencing symptoms about which there is lacking or conflicting information, or patients with bipolar features that do not meet criteria for bipolar I, bipolar II or cyclothymic disorder.

1.1.4 Age of onset and prevalence rates for bipolar disorder

The first manic or depressive episode of Bipolar disorder usually appears during the teenage years or early twenties, the peak age of onset being between 15 to 19 years old (Bauer & Pfenning, 2005). Earlier or later onsets may occur but in most cases patients have their first episode around the age of 18 (5th ed.; *DSM-5*; American Psychiatric Association, 2013). However, data attempting to date age of onset can be unreliable for it tends to be based on retrospective recall (Angst & Sellaro, 2000). According to the *DSM-5* (APA, 2013), lifetime prevalence rates for bipolar disorders I and II range from 0.6% to 1.8%. Nevertheless, evidence supported on a broader definition of the diagnosis of bipolar, suggests a higher prevalence of up to at least 5% (Akiskal et al., 2000).

1.1.5 Course of bipolar disorder

Bipolar disorder is a recurrent condition that becomes an ongoing problem for the vast majority of those who suffer from it. According to the DSM-5 (APA, 2013), more than 90% of those diagnosed with bipolar I, who experience a manic episode, will go on to have future episodes. Most of manic episodes are preceded or followed by a major depressive episode and this pattern will usually happen in a characteristic order for each person. In the cases where four or more mood episodes appear within the same year, the pattern is considered rapid cycling and is linked to a poorer prognosis. For all patients, there will be periods of time in between manic and depressive episodes in which they will experience significant symptom reduction so they will be able to, more or less, return to their normal interpersonal and occupational functioning. The pattern and order of consecutive episodes varies amongst patients, just as much as the duration of the euthymic period. The latter can last as little as a couple of days or as much as years, whilst the alternation between episodes can vary from regularly experiencing manic and depressive episodes, to a course of illness characterized by the display of a clear prevalence of either depressive or manic episodes (5th ed.; *DSM-5*; American Psychiatric Association, 2013).

Bipolar patients' quality of life is significantly worse than that of the general population, whilst their overall health and social functioning are comparable to or worse than that of clinically depressed patients (Dean et al., 2004). Additionally, cognitive deficits similar to those reported in unipolar depression, are present in

bipolar disorder but with a higher degree of impairment (Olley et al., 2005; Pavuluri et al., 2005). In view of this, bipolar disorder continues to be considered a disorder with a very poor prognosis, even when treated with mood stabilizers such as lithium (Angst et al., 2000), partly because functional recovery is harder to attain whereas syndromal recovery is more plausible (Tohen et al., 2000). Specifically in the UK, the economic value of workdays lost due to bipolar disorder has been estimated to be several times larger than the direct medical cost associated to hospitalization and medication (Das Gupta & Guest, 2002). Thus, recovery should not be outlined just in terms of symptom remission but should also include functional recovery and signs that demonstrate the individual has resumed his normal activities and is experiencing acceptable levels of quality of life (Harvey, 2006).

1.1.6 Suicide in bipolar disorder

In comparison to other mood disorders, bipolar disorder bares the highest suicide rates. It is estimated that between 30 to 50% of cases attempt suicide at least once during their lives with 10 to 20% of attempts being successful (Gonda et al., 2012). Therefore, completed suicide and suicide attempts are one of the main difficulties that relate to clinical management of bipolar disorders. Specifically in the UK lifetime suicide risk in individuals with BD ranges from 15% to 19%, with an estimated one-third of individuals with bipolar having made a suicide attempt (as cited by McKendrick et al., 2007).

1.1.7 Aetiology and treatments for bipolar disorder

Like with many other mental disorders, there is no clear picture of what causes bipolar disorder. Abundant research has been published regarding the hereditary aspect (genetic risk) of the condition, along with large amounts of studies that emphasize the biological features and some studies that discuss the role of psychosocial factors as precipitators of mood episodes. However, there is no certainty as to how the genetic, biological and psychosocial elements should interact for bipolar disorder to come into being (Anderson et al., 2012).

With regards to the genetic risk, data indicates that the likelihood of bipolar disorder in first-degree relatives of an individual with bipolar disorder is 5 to 20% (Empiric Risk Data, 2013), and thus the likelihood of a first-degree relative not developing bipolar ranges between 80 and 95%. The DSM-5 supports the genetic model and mentions that relatives of those diagnosed with bipolar are ten times more likely to develop the disorder (5th ed.; *DSM-5*; American Psychiatric Association, 2013). However neither biological nor psychosocial factors, and their role as precipitators of mood episodes, are mentioned in the manual. The main known biological factors are neurochemical imbalances and differences in brain structure, whilst the most frequently cited psychosocial factors are family context, social support, life events, dysfunctional attitudes and negative thinking patterns (Jones et al., 2010). From the biological and the psychological perspectives, two principal lines of treatment arise: 1) pharmacological management to address biological factors, and 2) psychotherapy to deal with psychological aspects. The medical approach makes use of mood

stabilizing drugs (usually lithium or an anticonvulsant) whilst psychological methods focus on cognitive processes such as thinking patterns. Using both kinds of treatment in conjunction is crucial, and helps to eradicate the belief that there is and should be a clear separation between biological and psychological factors, when in reality they interact and influence each other and thus are equally relevant when attempting to better understand bipolar disorder (Jones et al., 2010; Anderson et al., 2012).

In the UK, for example, as an attempt to reduce the cost associated with occupational dysfunction present in bipolar patients, it was proposed to use olanzapine instead of lithium, since it significantly reduces the number of affective episodes (McKendrick et al., 2007). However olanzapine was later found to be associated with increased risk of metabolic disturbances (Bauer et al., 2008), so it is reasonable to conclude that research in this field is much needed, given that the ideal mood stabilizer has not yet been found.

Thus, it is important to adopt a more inclusive perspective that allows us to think about bipolar disorder not only in terms of symptomatology, as described in the DSM-5 (APA, 2013), but also in terms of patterns of mood, behaviour and thought that oscillate between extremes and that are as varied as people themselves. Bipolar disorder can be experienced in a variety of ways by different people, whilst the term can help to describe a pattern, characterized by the presence of episodes, which share emotion dysregulation as their distinctive trait (Jones et al., 2010).

Because long-term outcome of bipolar disorder depends on systematic assessment,

treatment of bipolar disorder should not be only focused on alleviating acute symptoms. As stated before, bipolar disorder is a chronic and progressive multisystem disorder so considering both interpersonal and developmental aspects to design personalized treatments is essential (Leboyer & Kupfer, 2010).

1.2 Attachment

1.2.1 Attachment theory, its development and evolution

Attachment theory accounts for the quality and characteristics of meaningful relationships that are formed between individuals and result in socio-emotional human behaviour. The central idea of this premise is that social and emotional development starts within the relationships between a baby and its caregivers. Thus, this theory emphasizes the impact that initial experiences have in child development and later outcome (Bowlby, 1988; Bretherton, 1992).

The quality of the infant and caregiver bond influences adult outcomes both positively and negatively. Through interacting with caregivers, humans develop core aspects of their personality and a sense of security that allows them to become self-reliant and capable of emotion regulation (Bowlby, 1988; Bretherton, 1992).

Attachment theory was developed as a result of John Bowlby's interest in the effects of maternal deprivation in personality development. His ideas surrounding the mother-infant bond expanded throughout the 1940s, but more specifically after he

was asked by the World Health Organization to report his findings regarding maternal deprivation. By the 1950s, Bowlby along with many other researchers continued to investigate the mother-infant relationship, aiming to develop a new theory that could account for their observations. Theories of development at the time emphasized feeding and basic conditioning as the reasons behind the strong tie of an infant to his mother. However, Bowlby's and others' observations suggested that infants were drawn to their mothers for something more than food (Bowlby, 1988; Bretherton, 1992).

Bowlby held the notion that babies instinctually seek proximity to their mothers, but disagreed with psychoanalytic thinking that maintained that the instinctual aspect of it was directed to satisfy the basic need of hunger. Bowlby thought that it was something else that delineated the nature of the mother-infant bond. Instead of him looking at adult outcome and attempting to trace it back to its origins, he looked at childhood behaviour and tried to describe its potential future implications. What arose from his efforts to explain personality development, was the conceptual framework that we now know as attachment theory (Ainsworth & Bell, 1970; Bowlby, 1988; Bretherton, 1992).

The formulated rationale introduced the idea that underlying attachment lies a behavioural system that organizes infants' actions to encourage proximity to his caregivers, increasing their survival advantage by favouring protection and facilitating regulation of negative affect (Bowlby, 1969). Both genetics and the environment influence this system, thus it changes as development unfolds

(Ainsworth, 1989). According to Bowlby (1988), any behaviour that results in getting or retaining proximity to the caregiver is an attachment behaviour. This sort of conduct is mainly elicited under situations where the infant feels vulnerable and is in need of comfort and support; for example when experiencing fear, fatigue, illness or separation from the caregiver. However, under normal circumstances the presence of the attachment figure is hugely relevant too, since it provides the child with a generalized sense of security that allows him to explore the environment and, by doing so, further his development (Bowlby, 1988).

However, it is important to note that attachment behaviour and attachment to someone are two different things. The first can be exhibited in relation to several people whilst the latter is restricted to only a few significant others. For instance, infant attachment behaviour can be directed to any adult, in the absence of the infant's primary caregiver, but this does not mean that the infant will become attached to that one adult. This boundary is necessary to allow the child to be selective and form internal representations of the self and of significant others only (Bowlby, 1988). Once this selective process has taken place, the behaviour of those considered attachment figures becomes crucial, as it is in the face of responsive and sensitive caregiving that 'secure attachment' is fostered. In contrast, relationships characterized by inconsistent, insensitive and non-responsive parental behaviours, cultivate 'insecure attachment'.

Secure and insecure attachments are identified patterns of attachment. Psychologists Ainsworth and Bell (1970) were the first to describe differences in quality of

attachment. They applied attachment theory and designed an experiment called 'The Strange Situation' in which they observed and measured infants' responses, paying particular attention to behaviours relating to separation anxiety, the willingness to explore, stranger anxiety and reunion behaviour. Ainsworth rated the intensity of the observed behaviour on a seven-point scale. As a result of these observations they defined the attachment categories. The authors concluded that infants were either securely or insecurely attached dividing insecure attachment in two subcategories: anxious/avoidant and anxious/ambivalent (Ainsworth & Bell, 1970).

Infants considered 'securely' attached were able to explore the environment in the presence of their mother (including interacting with the stranger), since they used her as a safe base to return to if they needed to. Consequently, these children would react to their mothers' absence and appear distressed, whilst avoidant of the stranger. Upon reunion with their mothers, securely attached infants seemed pleased and welcoming, and thus sought contact and comfort from them. Contrastingly, 'insecure anxious/ambivalent' attachment was linked to intense distress in the absence of the mother, and generalized fear of the stranger. When reunited with their mothers, insecure-ambivalent infants would come close or seek attention from them, but actively resists contact. These children cried more and explored less, than all other infants, even in the presence of their mothers. Lastly, the 'insecure anxious/avoidant' attachment pattern was characterized by the lack of distress shown by infants upon their mothers' departure. Similarly, infants did not appear to mind the presence of a stranger and continued to be engaged in playing. Upon their mothers' return, avoidant infants appeared uninterested, remained distant, avoided contact and

actively ignored them (Ainsworth & Bell, 1970; Ainsworth et al., 1978). Main and Solomon (1990) later described the insecure/disorganized pattern of attachment to account for the variety of responses often observed in socially at risk populations, regarding whether or how to approach the caregiver. For example, upon reunion with their mothers, disorganized infants would present extreme behaviour such as freezing or approaching them walking backwards, which led the researchers to believe that these children could be experiencing their caregiver as frightened or frightening. However, because this behaviour would not last for prolonged periods of time, Main and colleague (1990) suggested that disorganized attachment should not be just taken as a fourth pattern of classification, but instead infants that fall into this category should be later assigned to one of the two main attachment patterns described by Ainsworth (secure or insecure). After the extreme behaviour ceased infants were thought to return to their usual organized form of attachment, which should be coded for, to be able to assign the child to a category of either secure/disorganized or insecure/disorganized.

Since the emergence of the concept of attachment patterns, large amounts of research have been carried out to further analyse the relationship these patterns hold with specific outcomes. For example, research has suggested that secure attachment is associated with the most positive short and long-term outcomes, whilst avoidant and ambivalent types of insecure attachment are associated with more challenging interpersonal and emotional situations. Furthermore, insecure/disorganized pattern of attachment has been found to be overrepresented in underprivileged samples, and has shown associations with significant disruptions in development and relatedness,

social disadvantage and its emotional and physical correlates (Carlson & Sroufe, 1995; Fonagy, 1996).

Insecure attachment observed in infants, is highly predictive of later regulatory and behavioural problems, such as aggressive disorders and childhood depression (Fonagy, 1996). Dysfunctional parent-child relationships have also been linked to the development of borderline pathology, dissociation and antisocial behaviour in children (Carlson & Sroufe, 1995). Furthermore, insecure attachment has been linked to adult psychopathology, with it strongly correlating with affective and anxiety disorders, eating disorders, substance abuse, borderline personality disorders, and antisocial personality disorders (Dozier et al., 1999).

The reason why attachment patterns influence outcomes is associated to the fact that attachment is central to the development of internal working models. The latter refers to what infants learn from their experiences of interacting with others that gets internalized and hugely influences their expectations and thus future reactions in the context of human interactions and relationships. Children will learn from early interactions whether their caregivers are sensitive and responsive and whether they themselves are deserving of affection. But because internal working models remain relatively stable throughout the lifespan, insecure attachment stands as a vulnerability factor that predisposes the individual towards negative expectations from their interactions with others and the adoption of maladaptive coping strategies (Bowlby, 1988). The latter refers to the fact that circumstances change, yet patterns remain, which can result in internal working models that are obsolete in the

individuals' current environmental situation, eliciting pathological functioning. When internal working models are adequate to a situation, they allow the person to establish realistic expectations about others and thus accurately predict others' behaviours and actions (Bretherton, 1992).

Based on the idea that once formed working models remain relatively stable, attachment theory expanded beyond its original purpose, which was to describe the patterns of infant-parent emotional relationships, on to the exploration of relationship styles in adulthood. Adult attachment can be approached from two perspectives, one based on the individual's memories of his relationship with his parents when he was a child, and the second being based on the individual's reflection upon his current meaningful relationships, namely friendships or romantic relationships. Assessment of attachment style in adults has been applied to the study of other psychological processes such as affect regulation, and also to the aetiology and treatment of psychopathology (Mikulincer & Shaver, 2012). Attachment is considered to be active throughout the human lifespan as important relationships, such as romantic relationships, are thought to activate the attachment system. According to Crowell et al. (1999), attachment relationships in adulthood continue to hold a high degree of value and exert an influence in an individual's functioning since they provide feelings of security and belonging.

Attachment theory in adults focuses on looking at the behaviours and emotions that have come to exist as a result of the early childhood experiences, and play a crucial role in the individual's personality and thus life experience. Then, adult attachment

style is a reflection of infant attachment patterns and contains information about the individual's beliefs, both positive and negative, with regards to the self and others (Mikulincer & Shaver, 2012).

Bartholomew and Horowitz (1991) proposed four types of adult attachment style. The first one was secure adult attachment, which is characterized by feelings of being comfortable with both intimacy and autonomy, plus a positive model of the self and the other within the context of a relationship. Securely attached adults feel entitled to be loved and consider the other worthy of love.

Additionally, Bartholomew and Horowitz (1991) suggested three types of insecure attachment: fearful, preoccupied and dismissing. Adults classified as fearful tend to avoid intimacy and social situations more generally, whereas individuals characterized by preoccupied attachment seem anxious about their relationships in general, since they hold a negative model of the self but a positive model of the other, thus they tend to expect to be abandoned. Lastly, dismissing adults engage in relationships although the value of intimacy is often rejected, due to the individual's positive model of the self but negative model of the other.

However, researchers have only recently started to examine the relationship between internal working models of attachment, social adaptation and emotion regulation in adults (Bartholomew & Horowitz, 1991). Thus, continued application of these ideas to better understand adult mental health is much needed (Ma, 2006).

In summary, throughout this section it has been discussed how attachment relationships persist throughout the lifespan and account for individual differences since they impact on development and therefore later outcome. However, attachment theory and the associated ideas were revolutionary when they first emerged and have had a profound effect in society, influencing and shifting the attitudes towards childcare and parenting.

1.2.2 Measures of adult attachment

Because of its influence on outcome, attachment in adults has become widely researched and as a result a variety of measures to assess relationship styles in adults have emerged. However, there are two main routes that researchers follow when assessing adult attachment. The first one is focused on the intergenerational transference of attachment patterns, thus it relies on adults' accounts of their early interactions with their caregivers and how they think these affect the way they parent their own children. The second stream of research is focused on other meaningful relationships that adults form and rely on such as romantic partners and friendships.

1.2.2.1 The Adult Attachment Interview

The Adult Attachment Interview (AAI) is a semi-structured procedure during which adults are asked to reflect on their early experiences with their parents. It was developed based on the premise that adults' current beliefs about their early experiences with their parents, could influence the way they parent their own

children and thus their children's attachment pattern. Thus, it was to explore this intergenerational transaction of attachment patterns that researchers developed the AAI (Bartholomew & Shaver, 1998). However it can be and is in fact widely used with adults in general even if they do not have children of their own.

This examination of the effects of childhood experiences in adults, allows researchers to categorize them into one of three identified patterns of attachment: autonomous-secure, preoccupied and dismissing. Generally speaking secure adults provide a coherent narrative of their early experiences (whether these were positive or negative), whilst preoccupied individuals struggle to organize their memories, leading to an inconsistent narrative that fails to provide with a clear sense of what that person's experience was like. Lastly, dismissing adults' narratives are characterized by a lack of content; these individuals do not manage to recall their early experiences so they tend to give brief and shallow answers (AAI: George, Kaplan & Main, 1985; Bretherton, 1992).

1.2.2.2 Self report measures

Adult attachment measured by self-reports informs us about a broader set of relationships and their quality. For instance these measures aim to gather information regarding an individual's close relationships, such as romantic partners, friends and other close bonds that are meaningful. Self-report questionnaires generally look at the conscious attitudes that individuals hold about the self and others, which is of particular value to researchers that are exploring the relationship between attachment

and illness, including mental health problems (Ravitz et al., 2010).

Unlike the AAI, self-reports tend to be dimensional instead of categorical. However, Bartholomew and Horowitz's model combines both and offers a two dimensional four-category model (Ravitz et al., 2010). Four prototypical attachment patterns (secure, fearful, preoccupied and dismissing) are described based on two dimensions, which go from positive to negative beliefs of both the self and others. The following is the diagrammatic representation of this model:

		MODEL OF SELF (Anxiety)	
		Positive (Low)	Negative (High)
MODEL OF OTHER (Avoidance)	Positive (Low)	SECURE <i>High self-worth, believes that others are responsive, comfortable with autonomy and in forming close relationships with others</i>	PREOCCUPIED <i>A sense of self-worth that is dependent on gaining the approval and acceptance of others (anxious)</i>
	Negative (High)	DISMISSING <i>Overt positive self-view, denies feeling of subjective distress and dismisses the importance of close relationships</i>	FEARFUL <i>Negative self-view, lack of trust in others, subsequent apprehension about close relationships and high levels of distress (avoidant)</i>

Figure 1.1 Two-dimensional model of adult attachment (Bartholomew & Horowitz, 1991).

The positive and negative dimensions are associated with a greater or lesser degree of internalization of self worth and that of others which translates into greater or lesser anxiety and avoidance (Ravitz et al., 2010). When self worth has been internalized the positive model of the self is characterized by less anxiety and less dependency on other's approval. On the other hand, when the individual does not feel worthy of love there will be an increase of anxiety and a lack of self-reliance. Additionally, when the other is perceived as worthy of love, the model of other is

characterized by positive expectations with regards to the other's actions, availability and supportiveness, which encourages the person to seek intimacy and hold close relationships. Contrary to this, a negative model of the self is characterized by avoidance of intimate relationships (Bartholomew & Shaver, 1998).

Furthermore, this model gives four attachment categories based on a combination of the two dimensions described above. Secure adult attachment emerges as a result of having a positive self-model and a positive model of others, thus there is little anxiety and avoidance, which enhances intimacy in relationships. Preoccupied attachment denotes a negative self-model and a positive model of others, which leads to the anxious search for acceptance and validation from others. Fearful attachment is characterized by a negative self model and negative other model, making individuals highly anxious, extremely dependent on external validation and thus likely to avoid intimacy to prevent the pain of loss or rejection. Lastly, dismissing attachment emerges as a result of having a positive self model and a negative model of others, which makes individuals avoid relationships since they deny their value; however, because they dismiss closeness to others and consider it worthless, they manage to maintain a sense of self-worth based on low anxiety regarding relationships (Bartholomew & Shaver, 1998).

Due to how practical they are to administer, self-report instruments are much more pragmatically adequate and suitable for large-scale studies, than interview based measures. Ever since Hazan and Shaver (1987) formulated the first self report to examine adult attachment in romantic relationships, development of this specific area

has come a long way and many other measures have been designed to enable researchers to look at parental and other types of close relationships, with instruments varying in their degree of reliability and validity (Crowell & Treboux, 1995; Bartholomew & Shaver, 1998; Ravitz et al., 2010).

1.2.3 Attachment and psychopathology

Birchwood (2003) postulates that amongst the several pathways to emotional dysfunction in psychosis is depression, alongside developmental trauma and difficulties with parental attachment. Thus, he emphasizes the need to address dysfunctional schemas of self and others during treatment of severe mental health conditions. Attachment theory provides researchers with a background that allows for the association of early childhood experience with later development, thus its relevance when understanding the emergence of psychopathology. Furthermore, the relationship that attachment holds with the development of emotion regulation is key when attempting to understand the mechanisms underlying the connection between attachment and psychopathology.

It is within early attachment relationships that the brain's main self-regulatory mechanisms develop, providing the individual with the opportunity to function effectively in society. However, attachment relationships cannot guarantee that the individual will perform effectively in adulthood; in fact, under certain circumstances these relationships can signify a major limitation (Fonagy & Target, 2002).

The unresolved attachment category as measured by the Adult Attachment Interview (AAI: George, Kaplan & Main, 1985) is characterized by a history of neglect, loss, separation and abuse and has been particularly linked with psychopathology in adulthood. In this context, psychopathology could evolve as a result of an individual's attachment requirements not being met when expected and needed (Ma, 2006). Unresolved attachment in adulthood transpires as a tendency to avoid relationships or become either a victim or victimizer when in a relationship. Given the neglect and abuse endured during childhood, individuals develop insecure internal working models or negative mental representations of the self and the other, which prevents the establishment of healthy relationships and hinders the ability to be resilient in the face of adverse life events (Dozier et al., 1999).

Sitko et al. (2014) examined the data from the National Comorbidity Survey (N=5877) to establish how current attachment style influenced the relationship between childhood adverse experiences and psychotic symptoms. The strongest finding suggested that anxious and avoidant types of insecure attachment fully mediated the relationship between childhood neglect and paranoia as a symptom of psychosis in adulthood. Interestingly, insecure attachment was unable to explain the relationship between sexual molestation and later depression. This study's results have important clinical implications. Assessment of attachment style should become routine during initial interviews held with psychotic patients. This would enable practitioners to tackle problematic internal working models of the self and others.

Moreover, difficulties regulating emotion have been identified as a risk factor for

psychopathology, and attachment has a fundamental impact on the development of emotion regulation. During infancy, emotion is perceived as being caused and regulated by others so, the ultimate aim of the attachment system in terms of development, involves the internalisation of the affect-regulation capacity. Any event that impedes the development of secure attachment during childhood (e.g. neglect, abuse or unavailable/unpredictable parenting) will compromise neurophysiological development associated with emotion regulation. A reduced emotional regulation capacity is likely to persist throughout an individual's life and originate further disturbances including personality disorders (Fonagy et al., 1997; Sarkar & Adshead, 2006). Thus, the successful outcome of secure attachment is the acquisition of the capacity to self-regulate affects later in life, whilst insecure attachment undermines an individual's capacity to self-regulate affect (Fonagy et al., 2004). Gross and John (2003), reported that individuals who tend to use dysfunctional strategies to regulate their emotions (e.g. suppression), are less willing to share not just negative but also positive emotions with others, which results in avoidance of emotionally close relationships.

In a recent study, Goodall et al. (2012), investigated mindfulness, attachment and emotion regulation within a sample of 192 participants with no formal training in mindfulness. This study's results showed a strong association between the constructs, suggesting that attachment style influences dispositional mindfulness, whilst the latter impacts on the ability to recognize emotions. These findings are relevant given that regulation of negative emotion is central to mental health; thus understanding the emotion regulation process and the mechanisms underlying it is key. Also, the

reassessment of one's thoughts and attitudes has been identified as a fundamental strategy to mitigate negative affect (Gross, 2002; Aldao et al., 2010). Thus, concepts such as metacognition and reflective functioning or mentalization, which have similar theoretical foundations to mindfulness, seem relevant and will be discussed in relation to emotion regulation and attachment later on in this literature review.

1.3 Emotion Regulation

1.3.1 Definition of emotion regulation

Emotions are a crucial element of human nature as they are part of the affective processes that give shape to human experience. Emotions can prompt behaviour, influence decisions or enable interpersonal relationships. However, they can also be experienced in a problematic manner if they arise at the wrong time or are accompanied by inappropriate levels of intensity, thus bringing about unwanted consequences such as social difficulties or, at the extreme, various forms of psychopathology (Gross & Thompson, 2007). Therefore, effective and functional regulation of negative emotion is an important ability to be fostered, whilst ineffective, maladaptive or dysfunctional emotion regulation should be avoided given the unwanted consequences that can be associated with it.

Emotion regulation is one of many self-regulatory processes. Different theories vary in their proposed considerations regarding how people regulate their emotions, but it has been generally accepted that the nature of the appraisals in relation to a specific

situation is key since it prompts an emotional response. The process behind the nature of such appraisals can be automatic or controlled, conscious or unconscious and has an influence in both the regulation and the generation of an emotion (Gross & Thompson, 2007).

Thus emotion regulation can be seen as an individual's capacity to manage emotional experience perceived as challenging (Phillips & Power, 2007), or more specifically as the individual's own inner and organizational processes through which he or she handles emotions, by either changing their experience/behaviour/expression or the situation (Gross & Thompson, 2007). Individual differences in patterns of emotion regulation become more permanent and go on to become personality traits (Cole et al., 1994). Although it has been recognised that individuals regulate positive emotions too (Gross & Thompson, 2007), the term emotion regulation is more often used in relation to people's ability to cope in the face of negative emotions. The capacity to regulate negative emotions is then constituted by specific strategies, which can be functional or dysfunctional, as well as internal or external depending on the resources being drawn upon to regain self-control. Most people show tendencies towards relying on certain type of strategies more than in others, which results in an individual regulatory style (Phillips & Power, 2007). Therefore, it is understood that emotion regulation is linked to individual functioning and can aid or hinder a person's performance. At the extreme of the dysfunctional dimension an individual's response to an emotion would be as inappropriate as is often seen in multiple forms of psychopathology where emotion dysregulation prevails (Cole et al., 1994; Gross & Levenson, 1997).

1.3.2 Development of emotion regulation

Effective regulation of emotions is a developmental achievement that aids and precedes various other important processes also attained throughout childhood. Especially because strong emotions have the potential to become overwhelming and thus disrupt other psychological processes, adequate regulation and expression of emotions is essential to optimal development (Diamond & Aspinwall, 2003). Emotion regulation, when effective, is crucial to adequate functioning since it facilitates goal attainment and promotes social competence (Cassidy, 1994).

Developmental theory proposes that emotion regulation develops gradually but it starts within the context of interpersonal interactions. Initially children rely on their parents to regulate their emotions, and then they gradually as they become more mature, adopt the parental observed strategies as their own (Diamond & Aspinwall, 2003). Traditional psychodynamic theory emphasizes emotion regulation as a core component of infants' experiences that strongly influences the development of both personality and psychopathology. Psychoanalytic theory suggests that early childhood emotions need to be regulated effectively or else they can turn into symptoms that will eventually emerge in adulthood (Cole et al., 1994). There is evidence to support the link between emotion regulation acquisition and maternal sensitivity. Longitudinal studies have shown that the quality of the relationships between infants and caregivers has substantial repercussions on various aspects associated to psychological adaptation including emotion regulation, intellectual resourcefulness and psychological problems (Fonagy et al., 1991; Main & Solomon,

1990). For example, a comparison of neglectful and non-neglectful mothers on emotional receptiveness and understanding found that neglectful mothers showed more negative reactions when the child expressed happiness. Consequently, children who experienced neglectful mothers seemed less able to understand and process environmental stimuli of an emotional nature, which led to them showing behaviours of withdrawal as a defence (Edwards et al., 2005).

This perspective suggestive of emotion regulation arising in infancy within the context of human relationships is strongly supported by attachment theory (Bowlby, 1969), which postulates that emotion as experienced within the mother-infant relationship provides the necessary basis to organize the infant's attachment style. If the caregiver is attuned and responsive the more likely outcome is for the child to be securely attached, whilst the opposite is true for insecurely attached children. The secure infant develops the expectation that his/her emotional needs will be acknowledged and met, whilst the insecure child expects his/her needs only to be met occasionally and often at random (Ainsworth et al., 1978; Cassidy, 1994; Fonagy, 1999). The repercussion of this is important given that the attachment style developed in early infancy will become internalized, as a working model, and will be used as a reference for future interactions (Bretherton, 1992; Cole et al., 1994; Fonagy, 1999).

Thus, from the available evidence one can conclude that humans are not born with the capacity to regulate their emotions, but instead this is gradually acquired within the context of the dyadic relationship that gets established between baby and the

primary caregiver. Infants need the caregiver to support them in regulating arousal to prevent further disorganization of the self. To achieve management of overwhelming emotions, infants seek proximity to the parent with the expectation of the emotional needs being met by a responsive and soothing caring figure. From this perspective the child's behaviour is believed to be charged with intention and specific expectations. The recurrent experiences with the parent will become internalized and thus crucial to personality development. Therefore, the attachment system can then be seen as a regulatory system that should help restore equilibrium in the face of challenging emotional circumstances (Fonagy, 1999). Thus the development of emotion regulation occurs within a social context of related factors that include parental or other caregiving figures on which infants rely on, and subsequently learn from, to manage their emotions.

1.3.3 Emotion regulation and psychopathology

According to Fajardo (1987), the essence of psychopathology lies in early childhood due to a deficiency in self-regulation and in assurance that the caregivers and the environment can be available for comforting and stimulation. During adulthood, lack of effective emotion regulation can substantially interfere with other processes such as social or cognitive ones, thus the term emotion dysregulation is used to refer to problematic emotion regulation patterns that are linked to such problems (Cole et al., 1994). Emotion dysregulation plays a significant part in mental health and illness, and it has been associated with over half of the DSM-IV Axis I disorders and with all of the Axis II disorders (Gross & Levenson, 1997).

Researchers have stressed the importance of emotion regulation in mental health by establishing that emotion regulation in healthy individuals facilitates goal-directed activities, and helps individuals to recover from negative life events and stressors (Fonagy et al., 2004; Pavuluri et al., 2005).

Therefore it seems understandable that conditions that involve impaired emotion regulation have a profound negative impact on interpersonal, social and vocational outcomes and constitute an increase in the likelihood of substance abuse and suicide (Maj et al. 2002; Torpy et al., 2009). The inability to regulate emotions has been linked to some of the most commonly reported mental disorders, such as major depressive disorder (Nolen-Hoeksema et al., 2008) and generalized anxiety disorder (Mennin & Fresco, 2009). Furthermore, impaired regulation of emotion has been associated to borderline personality disorder (Lynch et al, 2007), bipolar disorder (Johnson, 2005a) and schizophrenia (Norman & Malla, 1991).

Moreover, a recent national British survey (Marwaha et al., 2014) has highlighted the importance of addressing mood instability in severe mental health problems. The survey found substantial evidence to support that mood instability is a core feature of psychosis, more so than anxiety, depression and hypomania. Their findings suggest that mood instability mediates the impact of childhood sexual abuse on severe mental health difficulties. Moreover, mood instability seems to be present throughout the process and experience of psychosis, which implies that mood variation underlies the nature, development and persistence of psychotic phenomena.

Various individual emotion-regulation strategies have been assumed to be either risk or protective factors against psychopathology. Reappraisal and problem solving are thought to be functional and effective ways of regulating emotions under various circumstances (Aldao et al., 2010), whilst emotion inhibition is considered a strategy that can promote or hinder psychological functioning depending on which emotion is being inhibited. For example, inhibiting negative emotion such as sadness does not provide relief, whilst inhibiting emotional impulsive responses such as yelling or hitting can prove beneficial and more adaptive under certain circumstances. But for the most part, suppression of negative emotions hinders cognitive performance and social performance, whilst it does not decrease the subjective negative experience associated to the original emotion (Gross & Levenson, 1997). Cognitive performance is affected due to the constant need to utilize personal resources to repeatedly suppress an emotion and its associated behavioural expression. Furthermore, social performance is affected because emotional expression constitutes an important path of communication between individuals, by which one can express needs and preferences to others; thus if emotions are kept suppressed this form of communication is being somewhat impeded which can potentially lead to interpersonal problems and psychopathology (Gross & Levenson, 1997).

In a series of studies conducted by Gross and John (2003), they discussed the implications of using cognitive reappraisal or expressive suppression to regulate emotions and conclude that the former is an adaptive strategy whilst the latter is maladaptive. However, as previously discussed, suppression of inadequate emotional reactions can be adaptive under certain circumstances, therefore it is important to

consider the purpose that a given emotion may be serving during a specific situation before labelling the regulatory strategy that becomes activated as healthy or unhealthy. An important purpose of emotions is to provide information about a given situation and to enhance the individual's capacity to respond to it once the emotion has been processed. Emotion regulation strategies that call for processing of the emotion and thus promote the gain of understanding with regards to the associated situation are considered functional strategies. On the contrary, if the strategies that are being used to regulate emotions do not promote processing of the emotion, and thus hinder the understanding one person can gain about the associated situation (i.e. blocking or rejecting an emotion), then they can be considered dysfunctional. Furthermore, the nature of the resources used to achieve emotion regulation is also important. Based on whether the strategies draw upon personal/intrapersonal or environmental/interpersonal resources, they can be classified as internal or external. Both internal and external strategies can be functional and dysfunctional (Phillips & Power, 2007). It has been found that recurrent use of dysfunctional emotion regulation strategies is associated to more emotional complaints, interpersonal problems and hyperactivity.

More specifically Phillips and Power (2007) suggested that internal dysfunctional strategies were linked to emotional symptoms, which is indicative of the individual internalising the experienced problem, whilst external dysfunctional strategies were related to behavioural difficulties suggesting the externalization of the problem that elicited the emotion in the first place. Furthermore, the frequent use of internal and external functional strategies seemed associated with less emotional, behavioural and

interpersonal problems, as well as with greater quality of life, whilst dysfunctional strategies (internal and external) were associated with reduced physical health and poor quality of life (Phillips & Power, 2007).

Other emotion regulation strategies that have been more often hypothesized as protective factors against mental health problems are reappraisal, problem solving and acceptance (i.e. mindfulness). Contrariwise, strategies involving emotion suppression, avoidance and rumination have repeatedly been postulated as risk factors. Often these six regulation strategies are investigated within the context of those disorders considered to be fundamentally emotional or internalized (i.e. depression and anxiety), whilst disorders accompanied by behavioural problematic expressions, also called externalized disorders, are more often analysed within the context of the abnormal conduct that is being showcased. However, there is evidence to believe that externalizing disorders are also linked to dysfunctional emotion regulation but that reward sensitivity may play a crucial role as a mediator of the relationship between emotion dysregulation and outcome (Aldao et al., 2010).

Avoidance, rumination and suppression have all been found to be positively associated with depression, anxiety, eating disorders and substance abuse, whilst problem solving and reappraisal are reported to be negatively correlated to these disorders. Moreover, some strategies play a more important role in certain psychopathologies. Rumination, for example, has a large effect on depression and anxiety, whilst avoidance, problem solving and suppression have a moderate effect. On the contrary, positive strategies like reappraisal and acceptance present only

small effects on depression and anxiety. This evidence seems indicative of the relevance that the presence of maladaptive strategies has when it comes to mental health problems, rather than the comparative absence of adaptive strategies to regulate emotions (Aldao et al., 2010).

Also important is to note the difference between the effects that functional or positive versus dysfunctional or negative strategies have on internalized and externalized psychopathologies. As mentioned before, rumination, suppression and avoidance have a large effect on depression and anxiety (internalized/emotional disorders), whilst they only have a medium to small effect on substance abuse and eating disorders (externalized/behavioural disorders). Similarly, reappraisal had a medium effect on depression and anxiety but a small one on substance misuse and eating disorders. These patterns are indicative of mood-related disorders such as depression and anxiety, being more strongly associated to specific deficits in emotion regulation than other type of disorders such as substance abuse and eating disorders (Aldao et al., 2010; Gross & John, 2003). One possible reason as to why functional strategies, such as reappraisal, seem less strongly associated with depression and anxiety than dysfunctional ones, such as suppression, could be related to where in the emotion-generative process these strategies arise. Reappraisal is thought to come in early in the process, whilst suppression comes in late. Thus reappraisal allows the individual to change how he thinks about the situation to decrease the emotional impact, whilst suppression consists of inhibiting the unpleasant feelings, which does not decrease the emotional impact and in fact can sometimes impair cognitive processes such as memory. Suppression is cognitively costly because it decreases the

expression of both positive and negative emotion, and also because it is considered to require constant self-monitoring and self-correcting actions to be exerted throughout the process of emotional experience (Gross & John, 2003; Gross, 2002).

In summary, the evidence supports the notion of distinctive forms of emotion regulation being linked to different outcomes (Gross & John, 2003), given that they bring about different consequences at a cognitive and interpersonal level, and they draw upon different intrapersonal resources. Maladaptive or dysfunctional strategies such as rumination, avoidance and suppression, are overall more prominent in mental health difficulties than the lack of adaptive or functional strategies such as problem solving, acceptance and reappraisal, with the association between internalized disorders and dysfunctional strategies being particularly strong (Aldao et al., 2010). However, there is still considerable uncertainty about why emotions are dysregulated in different forms of psychopathology, and what these dysregulated emotional responses indicate with regards to the nature of specific problems (i.e. cognitive deficits, mood instability, lack of social support and decreased well being) encountered by those suffering from mental disorders (Gross & John, 2003; Gross, 2002).

1.4 Reflective functioning

1.4.1 Definition of reflective functioning

Reflective functioning is a developmental concept that refers to the psychological

processes that underlie the human capacity to understand behaviour of the self and others (i.e. mentalization), in the light of mental states and intentions. Reflective functioning has been widely accepted as essential to a range of attachment and other developmental outcomes because it is intimately related to the evolving representation of the self (Fonagy et al., 1998). Thus the capacity to understand human behaviour in terms of desires, feelings, wishes and beliefs (i.e. mental states), is an important developmental achievement to support self-organization (Fonagy & Target, 1997). Reflective functioning, unlike other conceptually similar concepts, is defined as an automatic unconscious process that gets activated when attempting to understand human behaviour and gain greater knowledge of minds in general (Fonagy et al., 2004).

Peter Fonagy, Mary Target, Miriam Steele and Howard Steele, defined the concept of reflective functioning in the Reflective Functioning Manual (1998) as an individual's capacity to envision mental states in the self and others. Mental states are understood as experiences such as feelings, thoughts, beliefs, desires and intentions (Slade, 2005; Fonagy et al., 1998). Reflective functioning acquisition enables individuals to respond not only to another person's behaviour, but also to the personal conception of others' beliefs, feelings, attitudes, desires, hopes, knowledge and intentions. Thus this capacity is fundamental to make other people's behaviour meaningful and predictable, as well as to help the individual differentiate inner from outer reality (Fonagy & Target, 1997). Children start to acquire reflective functioning when they begin to understand other people's behaviour, and can flexibly activate the most suitable set or sets of self-other representations they have

previously identified, in order to respond appropriately to specific interpersonal interactions. Individuals differ in the extent to which they are able to reflect about their own or others' actions in terms of beliefs, desires, intentions and so on, but more importantly, the capacity to reflect varies across situations (Fonagy et al., 1998).

Reflective functioning is conceptually similar to 'theory of mind' and metacognition. The concept of theory of mind (Premack & Woodruff, 1978) was introduced to refer to the human ability to explain, predict and interpret behaviour in terms of mental states. This capacity, same as reflective functioning, seems to have adaptive purposes given that it is fundamental to social interactions. Similarly, the concept of metacognition (Flavell, 1979) refers to the capacity that humans have to think about their thinking, know about their knowledge and reflect about their actions. Initially the concept was limited to the human capacity to regulate and monitor cognitive phenomena, but nowadays this concept is broader and includes not only cognitive states, but also affective states, motives, intentions and involves self-regulatory and monitoring processes with relation to all mental states (Papaleontiou-Luca, 2008). It is evident that the three terms overlap in their theoretical conceptualizations and in that they are all developmental and placed at the core of various more favourable or unfavourable outcomes. Thus, it is not uncommon to find literature where the terms are used interchangeably. However, it is important to note that a lot of the research that has been conducted, with these concepts at the core of the investigator's interests, is substantially different in terms of methodology, scientific emphasis, practical applications and the type of sample.

1.4.2 Acquisition of reflective functioning

Reflective functioning or mentalization, is not only fundamental to social interactions, but it arises within the context of early interpersonal relationships. The attachment system is closely linked to the development of reflective function (Fonagy & Target, 1997). From this standpoint, the capacity to interpret own and other's behaviour in terms of mental states is directly dependant on the quality of the early social interactions, particularly those that are emotionally charged such as the ones involving primary caregivers. Reflective functioning becomes observable through someone's capacity to give a conceivable interpretation or account of one's own and others' behaviours, through a coherent narrative expressed in terms of feelings, beliefs and other mental states (Fonagy et al., 2004; Fonagy & Target, 1997).

An infant begins to understand himself by assimilating the mental states of those around him. Through exploring the meaning of others' actions, the child begins to develop reflective functioning and the capacity to better understand his own psychological experiences (Fonagy & Target, 1997). This emerging reflective capacity serves as the basis to acquire affect regulation, self-monitoring capacities, impulse control and a sense of self-agency. Thus, reflective functioning constitutes an essential element to develop a sense of self-organization (Fonagy et al., 2004; Fonagy & Target, 1997).

The nature of family interactions is crucial to foster the acquisition of the intentional

stance, or in other words the ability to explain or predict others' behaviours in terms of beliefs, thoughts and intentions (Fonagy & Target, 1997). All human beings are born with the capacity to develop the ability to mentalize, but early relationships create the opportunity for the child to learn about mental states, and determine the depth to which the social environment can ultimately be processed. During the first five months of a child's life, face to face exchanges of affective signals between infant and caregiver play a key role in the development of the child's representation of affect (Beebe et al., 1997). Parents' tendency to treat the infant's spontaneous gestures as if they were intentional communications leads to infants seeing themselves as having intentions and starting to communicate intentionally (Bruner, 1983). When the emotional state of the child is reflected back to him (marked mirroring), the caregiver is essentially organizing the child's experience. A caregiver that displays mirroring and markedness is effectively showing the infant that emotions are not overwhelming and that they can be contained and regulated (Fonagy et al., 2004). However, the dyadic relationship does not only flow from caregiver to infant. Beebe and Lachman (2003), proposed that the early dyadic interactions work more like systems in which interaction and experience are co-constructed and both the infant and caregiver are affected by their own and the other's behaviour. This view implies that self-regulation and interpersonal regulatory processes arise simultaneously.

Positive early interpersonal relationships, which have the necessary elements to be considered representative of secure attachment, predispose the infant to take advantage of the available social interactions and tend to generate greater

psychological understanding. The same social processes that foster reflective functioning and self-organization ensure attachment security; therefore the secure infant becomes a mentalizing child (Fonagy & Target, 1997). Securely attached infants interact with sensitive caregivers able to recognise and non-verbally communicate the child's intentional stance from birth. Interactions at this level are important because they will become reference to future goals given that they contain explanatory constructs in the interpretation of the behaviour of others. This recognition and communication of the infant's intentional stance is known as mirroring. Sensitive caregivers mirror the infant's emotional states in a way that is neither too close nor too remote from the child's experience. If the mirroring is too accurate it turns into a source of fear, whilst if it is too remote or unavailable the process of self-development is deeply compromised (Fonagy & Target, 1997). Mirroring is not only important to inform the child about his own internal states, but also to soothe and regulate the infant's affects. The child experiencing an emotional state identifies the response of the sensitive caregiver and internalizes it to use it as part of a higher order strategy of regulation. Mirroring becomes available via the caregiver's own capacity to mentalize about early experiences. The clarity and coherence of the caregiver's representations mediates the relationship between her attachment style and her maternal behaviour. The quality of reflective functioning exhibited by the caregiver thus predicts the child's security of attachment (Fonagy et al., 1991).

Parental reflective functioning allows the parent to access, flexibly and coherently, the emotions and memories relevant to personal early experiences, whilst it provides

the foundations of a secure base for the child to develop (Fonagy & Target, 2002). Moreover, it allows the parent to be sensitive to the infant's needs, which translates in an environment that fosters pretend play, language development and social engagement (Fonagy & Target, 1997). Parental sensitivity is then the ability to perceive and correctly interpret the infant's cues, whilst providing with a consistent response thus making the environment safe for the child to acquire self-regulation abilities and relatedness (Feldman, 2003). Maternal responsiveness and sensitivity predict child secure attachment at one year (Keren et al., 2003), whilst secure attachment associates with the child's mentalizing ability (Fonagy et al., 1991, Fonagy & Target, 1997).

However, this does not mean that reflective functioning will not develop under circumstances characteristic of insecure attachment. The insecure-avoidant child evades others' mental states, whilst the insecure-resistant child focuses on his own state of distress. So in those instances reflective capacities are compromised and appear to be hindered. But insecure-disorganized children represent an exception; because the caregivers of infants categorized as disorganized are unpredictable, the child becomes hyper-vigilant of the caregiver's behaviour. Thus, insecure-disorganized infants become capable of predicting others' behaviours. However, this reflectiveness does not extend to the self. Because the child needs a disproportionate amount of resources to understand the parent, the capacity to reflect on self-states seems impaired. Thus, mentalization is useful to the insecure-disorganized child to better understand others but does not have the central and effective role in self-organization, characteristic of securely attached infants (Fonagy et al., 2004; Fonagy

& Target, 1997).

In summary, given that maternal mentalizing ability and attachment security are two main predictors of the development of reflective function in children, it is understood that the child's capacity to become aware of his own mental states and those of others is dependent on the extent to which the caregiver's behaviour indicates such states. Moreover, reflective functioning develops as a result of many dynamically interacting influences that are intrapersonal and interpersonal in nature, such as the individual's emotions, family relationships and social interactions (Fonagy & Target, 1997).

1.4.3 Reflective functioning and psychopathology

In the past twenty years, research on the role of reflective functioning in the development of borderline personality disorder has proliferated. This theoretical conceptualization has driven the efforts to develop adequate treatments for borderline personality disorder based upon the concept of mentalization. The conceptual guidelines underlying this research line have been expanded onto other disorders such as depression, eating disorders, first episode psychosis and obsessive-compulsive disorders (Fonagy et al., 2011). Theoretically, impaired reflective functioning has been conceptualized as a mediator between early adverse experiences and later negative outcomes such as the emergence of psychopathology. However, for the most part the theoretical claims are based upon clinical observations rather than empirical evidence (MacIntosh, 2013).

In terms of the relationship between early experiences and later outcome in adult life, there is a substantial amount of evidence to associate childhood difficulties to adult psychopathology (Brewin et al., 1993). Similarly, there is considerable clinical evidence to support the notion that adverse early life is linked to impaired reflective functioning (Bateman & Fonagy, 2004). From the body of clinical evidence it has been concluded that individuals who experience a difficult childhood lack an important protective factor, which is the capacity to understand interpersonal situations (mentalize). Challenging family environments make people vulnerable to experience long-term maladaptive effects that hinder their ability to effectively recover from adversity due to impaired mentalization ability. From this viewpoint developmental psychopathology is a likely outcome of poor reflective functioning (Fonagy & Target, 1997; Fonagy et al., 1994).

In a 1996 study Fonagy and colleagues examined the relationship between attachment, mentalization and psychopathology. Their sample consisted of 82 non-psychotic inpatients and 85 normal control participants. Groups were matched on age, gender, socio-economic status and verbal IQ. The Adult attachment interview (AAI; George, Kaplan & Main, 1985) was used to code for reflective functioning with the RF scale (RF scale; Fonagy et al., 1998). On average, normal controls obtained higher reflective functioning scores than the diagnosed participants. From the diagnosed group, it was individuals with a diagnosis of borderline personality disorder (BPD) who showed the lowest levels of reflective functioning. Hierarchical linear analysis was used to identify the relationships between early abuse, low mentalization capacity and a likely diagnosis of borderline personality disorder. Most

of the identified cases that reported abuse were also diagnosed with borderline personality disorder (60%), whilst only 14% of those who did not report abuse were diagnosed with BPD. Moreover, the likelihood of reported abuse being linked to a BPD diagnosis was greater in those who also showed impaired reflective functioning (below a score of 3 in the RF scale). Only 17% of those participants who reported abuse and scored above 3 in the RF scale were also found to hold a BPD diagnosis, whilst the vast majority (97%) of those reporting abuse and scoring below 3 on RF were diagnosed with BPD. In the group that did not report any early childhood abuse, the prevalence of a BPD diagnosis was the same amongst those with RF scores above and below 3. Thus, these results were indicative of mentalization being an important mediator or perhaps a protective factor against the development of borderline traits in the presence of childhood abuse. Moreover, positive associations between mentalization and axis I and II diagnoses have been found, with increased RF capacity being inversely related to personality disorders. In fact, RF levels seemed a better predictor of axis II disorders than attachment organization or axis I disorder comorbidity (Bouchard et al., 2008).

Fossati et al. (2011) also assessed the mediational effect of mentalization between attachment style and BPD traits. They used a large community sample of 501 students. The association between attachment status and BPD was severely undermined when reflectiveness was introduced to the hierarchical regression model, which strongly suggests that RF is an important mediator between early experiences and borderline traits.

In another study Levinson and Fonagy (2004), recruited 22 prisoners who had been referred to a Health Centre due to a psychiatric diagnosis. Half of the participants were diagnosed with BPD. There were two comparison groups, one was a personality disorder group recruited from an inpatient hospital and the other one was a control group recruited from a medical outpatient department. Groups were matched on age, gender, IQ, socio-economic status and diagnosis as appropriate. The prisoners group obtained, on average, the lowest RF score (2.5) of all three groups, followed by the inpatient group (3.7) and lastly the control group (5.8). The difference between the prisoners group and the inpatient group was statistically significant. Overall a greater proportion of criminal offenders reported more early abuse and scored below 3 in the RF scale than non-criminal offenders. Also, unsurprisingly the prisoners group scored higher for severity of mental health symptomatology. The results of this study suggest that RF is important to differentiate criminal groups with a mental health diagnosis from groups with similar problems but no criminal tendencies. Thus reflective capacities differentiate between symptom severity with regards to mental health diagnosis (Levinson & Fonagy, 2004). However, although interesting, these results cannot be easily interpreted nor definite conclusions can be reached due to the small sample size that this study relied upon.

Along the same line of research Fossati et al. (2009), explored the relationship between insecure attachment organization and aggression in a large community sample of 637 participants. They found positive correlations between attachment insecurity and impulsive aggression, but these became less significant when

reflective functioning was introduced into the model, thus suggesting a partial mediation of the initial association.

Because reflective functioning is a key component of regulatory systems such as the emotion regulation system (Fonagy & Target, 1997), its consideration is crucial to advance the understanding of the development of various psychopathologies. When a caregiver fails to represent a child's affects, these affects remain distorted and unrepresentable to the infant leading to a range of borderline traits and general pathology of the self in adulthood (Slade, 2005). Impaired reflectiveness arises as a way to cope with the parental lack of sensitivity. The infant withdraws from the mental world as a way to adapt, modify or avoid the threatening situation. Limited RF developed by the maltreated child helps predict and prevent maltreatment, thus it is adaptive in its original context but it produces sophisticated forms of difficulty with adaptation in other contexts (Fonagy & Target, 1997).

Another interesting study (Stein et al., 2004) explored reflective functioning as a mediator between childhood maltreatment and negative interpersonal outcomes. Data was gathered from 77 former participants in a day treatment programme for childhood emotional distress, 48 healthy controls and 25 inpatients with a psychiatric disorder. The researchers identified, through structural equation modelling, that mentalization mediated the relationship between early childhood trauma and difficulties with adult social functioning in the domains of romantic functioning and social assertiveness.

MacBeth and colleagues (2011) examined the relationships between attachment organization and mentalization levels with first episode psychosis (FEP) and its associated symptomatology, onset, engagement and adaptation variables. A sample of 34 participants who were in the first 12 months of treatment for FEP was recruited. Individuals with secure attachment classification or insecure-preoccupied scored significantly higher on the RF scale than those with insecure-dismissive, whilst no significant differences were found between the secure and the preoccupied groups. Unsurprisingly, reflective functioning levels in this sample were below what may be expected from a sample of healthy controls. Also, the results of this study suggested reflective functioning to be negatively associated with quality of life. These results demonstrate that low reflective functioning is associated to first episode psychosis and also to social functioning within this challenging context. Seems like individuals experiencing difficulties such as FEP are left more vulnerable in the presence of increased reflectivity because this would also raise awareness of the impact that the psychotic breakdown can potentially have on the person's environment, that is general quality of life and relationships.

Braehler and Schwannauer (2012) examined the moderating effect of reflective functioning in the recovery from adolescent onset psychosis. The researchers gathered data from 8 adolescents and used a grounded theory approach to investigate the participants' experiences of adaptation to psychosis. Associations between reflective functioning and adaptation were qualitatively examined by means of the narratives obtained from the administration of the AAI (Bartholomew & Shaver, 1998). The results indicated that all participants showed levels of reflectiveness that

corresponded to their beliefs about adaptation to psychosis and interpersonal relationships. This implies that reflective functioning serves as a moderator between the negative experience of psychosis and later adaptation. More precisely, moderate RF was linked to effective adaptation whilst low RF was associated to ineffective adaptation after psychosis due to prevailing rumination over the impact of the experience or constant denial of the emotional implications of it. The majority of the adolescents classified as low in RF failed to positively adapt after psychosis and remained distant from interpersonal relationships. Thus, this study is unique in that it highlights the importance of mentalization not just as a mediator between early adversity and psychopathology as an outcome, but also as an important factor to increase the chances of successful recovery from severe mental health difficulties. Moreover it is unique because of its focus on RF and its impact on adaptation to life after psychosis in adolescents.

In summary, it seems like impaired mentalizing characterizes several psychological disturbances (Fonagy et al., 2011). However, although research in this area is promising, most of the identified empirical studies have been carried out with BPD populations and/or utilizing the RF scale to assess reflectiveness. These two aspects mean that samples are either too small or biased to the specific challenges faced by those who experience borderline personality disorder. This scenario signifies that there is an opportunity to advance mentalization research using larger non-clinical populations by recruiting community samples and assessing reflective functioning in a more sound and time and cost efficient way (MacIntosh, 2013; Fonagy et al., 2011). Thus, empirical research in mentalization has a lot of potential, and still more

exploration is necessary to better understand the mediating role of this important human capacity, in relation to early adverse experiences and the incidence of negative outcomes.

1.5 Metacognition

The concept of reflective functioning is intimately linked to that of metacognition. In fact, according to the RF manual, the measurement scale devised by Fonagy and colleagues (1998) evolved from a seminal chapter on metacognitive monitoring written by Mary Main in 1991 (as cited by Fonagy et al., 1998). Thus, the RF scale is considered to measure individual differences in metacognitive ability across adults. From this point of view, metacognition, mentalization and reflective-functioning are all interrelated concepts and in effect expressions of the same human capacity that stands at the core of self-development (Fonagy et al., 1998).

Like reflective functioning, the concept of metacognition arose within the context of social learning. Thus, it has been suggested that metacognitive capacities and reflective functioning overlap to a large extent (Lysaker et al., 2011), for which they are treated very similarly across the literature, sometimes used interchangeably.

However, one key difference is the way each construct can be assessed. There are various metacognition self-report questionnaires whilst the measurement of reflective functioning still holds major limitations (MacIntosh, 2013; Fonagy et al., 2011). For this reason it was decided to include metacognition as a predictor variable in the

present study.

1.5.1 Definition of metacognition

Metacognition is defined as the ability to think about thinking, both about one's own thoughts and those of others. However, it is not merely a cognitive capacity but a uniquely human capacity that allows individuals to make sense of their own and others' behaviour, thus it is key for successful adaptation (Lysaker et al., 2011). Similarly to reflective function, research using the metacognition concept has suggested that the phenomenology of symptoms in psychopathology may be a reflection of difficulties in different aspects of metacognitive functioning. Metacognition thus entails a process of second order cognitions that involves thinking about thoughts, knowledge, actions, affects, motives, and intentions (Papaleontiou-Luca, 2008). Thus, like reflective functioning, the concept of metacognition is highly relevant to self-regulatory processes.

1.5.2 Metacognition and psychopathology

Consistent with the literature regarding reflective functioning, deficits in metacognition have been associated to poorer outcomes regarding mental health, thus it has been proposed that the core common component of symptom expression in various forms of psychopathology is indeed a lack of metacognition (Lysaker et al., 2011). However, unlike with reflective functioning, research on metacognition has also expanded to examine the clinical correlates of increased levels of

metacognitive functioning. From this view point metacognition is a combination of functions that can be selectively diminished in some conditions or interact together creating more difficulties that hinder a person's coping capacity (Lysaker et al, 2011). For example, Wells and Carter (2001) examined the maladaptive metacognitions of those suffering from generalized anxiety disorder (GAD), social phobia, panic disorders, depression and healthy controls and concluded that all of these disorders are somewhat associated to increased negative metacognitions, generalized worry and meta-worry (worrying about being worried), but these particular traits are significantly more prominent in GAD. Specifically, they identified that participants diagnosed with GAD were more worried about controlling their thoughts and feared what they perceived as the associated danger to failing to control their thoughts. Moreover, the differences found across the GAD and the depressed group suggest that analysing the content of thought can differentiate anxiety and depression.

Lysaker and colleagues (2005) assessed metacognition capacities, in a sample of 61 male schizophrenic patients, through three domains: the capacity to understand one's own mind, the ability to understand other's mind, and mastery which refers to the ability to work through one's distressing thoughts and mental states. Their findings indicated an association between lower levels of metacognition and increased social withdrawal, neurocognitive impairments and poor quality of life. Yet, other specific interesting relationships were also identified. For example, depression was positively associated to the capacity for understanding one's own mind. The implication of this is that greater awareness of one's own thoughts comes with increased psychological

pain in the face of extreme mental health difficulties such as schizophrenia. Moreover, poor quality of life and limited introspection were specifically linked to impairments on the metacognitive domain of mastery, suggesting that purposeful problem solving is an important capacity to promote inter and intra personal well being. However, the studies interesting findings are correlational and thus not appropriate to draw causal conclusions, plus the sample was limited in terms of number of participants and biased regarding gender.

Lysaker and Daroyanni (2006), presented a case study about a man in his 30's who meets the criteria for schizophrenia and presents deficits in attention, verbal memory, executive functioning, incongruous affect, grandiose delusions and impaired judgement. Analysis of the therapeutic process undertaken by this patient supports the notion that there are associations between metacognitive impairments and interpersonal and neurocognitive difficulties. Moreover, a metacognitive understanding of the mental states of the self and others was associated to therapeutic outcome. Thus, the authors focused on a therapeutic process that enabled the development of metacognitive abilities and effective emotion regulation strategies, through the therapist's sympathetic attitude and his assistance in clarifying, eliciting and reflecting on relevant material in a non-judgemental open manner. However, although a deficit in metacognition is a distinctive element of psychopathology, the other extreme in which an individual is constantly monitoring his own thinking is also pathological. Wells and Carter (2001) discuss the persistence of maladaptive metacognitions in relation to disorders characterized by intrusive thinking. For example in generalized anxiety disorder (GAD), it has been observed that

pathological worry is associated to increased negative metacognitive beliefs (Wells & Carter, 2001). Thus, in anxiety disorders, where there is worry proneness, negative-metacognitions play an important role in perpetuating intrusive thoughts and worrying.

In a study about generalized anxiety disorder (Wells & Carter, 2001), the authors examined the metacognitions of GAD patients and compared them against those of patients suffering from social phobia, panic disorder, major depression and a group of healthy controls. More specifically they focused on the role of ‘positive beliefs about worrying’ and ‘negative beliefs about worrying’ in GAD. They propose that these maladaptive metacognitions are to anxiety disorders, what positive and negative beliefs about rumination are to depression. They recruited 24 participants per group (5 groups) with approximately half of them being male and all of them between 30 and 40 years old. Maladaptive metacognitions were assessed with the Meta-Cognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997). Their findings indicate that patients diagnosed with GAD report high levels of negative metacognitions about uncontrollability and danger of their thoughts, in comparison to all other groups. Patients with panic or social phobia and those suffering from depression present more negative metacognitions with regards to health or social situations.

In summary, the literature points to metacognition being similar to RF in the respect that it is key to fostering a sense of ownership and agency, thus making it a crucial element to be analyzed in personality disorders, obsessive compulsive disorders,

depression and even psychosis where self-agency is generally impaired. However, unlike the literature about reflective functioning, metacognition research has also explored maladaptive metacognitive activity with links between negative metacognitive processes and anxiety or other types of disorders such as depression and phobias having been established (Dimaggio et al., 2009). This suggests that metacognition is not always a protective factor, but it depends on the content of the metacognitive activity and the degree to which this is present in individuals. Furthermore, it is clear from the literature that metacognition and reflective functioning differ in terms of the processes involved, with metacognition involving primarily cognitive processes whilst reflective functioning also includes emotional processing.

1.6 Risk factors for developing bipolar disorder

1.6.1 Environmental risk factors for bipolar disorder

There are many contributing factors to the development and course of bipolar disorder. Some evidence suggests environmental factors play a critical role in the onset and course of BD, although there is a substantial amount of evidence that focuses on the genetic link within the disorder (Johnson et al., 1999). However, psychosocial variables are important because they have the potential to interact with biological vulnerabilities and shape outcomes (Johnson, 2005a). Thus, contextual factors such as life events and perceived social support are relevant to better understand and predict bipolar patients' interpersonal and occupational performance

(Sanchez-Moreno et al., 2009). Although these variables will not be accounted for in this empirical work, it is relevant to review them in this section given the potential relationship between them and the developmental variables that will be studied.

1.6.1.1 Life events and social support in bipolar disorder

Stressful life events and social support perceived as insufficient or inadequate have been identified as crucial psychosocial risk factors that impact on the prevalence, course and outcome of bipolar disorder (Hays et al., 1998; Kendler et al., 1999; Jaffee et al., 2002; Alloy et al., 2005). However, surprisingly the association between stressful events and social support in bipolar disorder has been understudied compared to the number of studies addressing these issues within other disorders such as unipolar depression (Johnson et al., 2003; Kauer-Sant'Anna et al., 2007).

Within this context, life events can be defined as acute events whose clinical importance is dependant on the meaning they have to the patient and the perceived severity of both the event and the associated consequences (Morris, 2006), whilst social support comprises helpful actions performed for an individual by significant others (Johnson et al., 2003). Similarly to life events, the subjective perception of social support is crucial to determine its role within the context of bipolar disorder onset, course and outcome.

Studies of psychosocial risk among bipolar individuals have noted that life events perceived as stressful are key triggers of mood dysregulation, whilst perceived

inadequate social support is prevalent in a lot of bipolar patients (Hays et al., 1998; Johnson et al., 2003). Hays and colleagues (1998) examined the association between age of onset, stressful life events and social support in a sample of 74 bipolar patients. This study established that late onset is different from early onset bipolar disorder. The age of onset was negatively associated with stressful life events, whilst it was positively associated with social support. These findings indicated that the subjective perception of the available social support was positively associated with later onset of both depression and mania. Conversely, the negative relationship between stressful life events and age of onset indicated that the earlier the onset (i.e. the younger the person) the greater life event reactivity. In sum, this study suggests that age of onset is an important variable that interacts with psychosocial factors such as life event reactivity and perceived social support. Early onset appears to be associated with an over-time tendency to evaluate life events as stressful or negative and perceive less social support. However, these findings are limited by a relatively small sample size and a cross-sectional design.

In general, researchers have found that bipolar patients report an increase in severe negative life events prior to the onset and recurrences of bipolar episodes (Alloy et al., 2005; Johnson, 2005b) suggesting that life events perceived as traumatic trigger bipolar episodes and are associated to poorer outcomes (Garno et al., 2005). This positive correlation between stressful life events and subsequent affect dysregulation could be indicative of bipolar individuals as being more susceptible to react negatively to life events. Thus it has been tested whether social support protects against life events and diminishes the associated reaction. Johnson and colleagues

(1999), in a sample of 52 bipolar patients found that social support did not buffer the effects of life events, which is consistent with other people's findings (Cohen et al., 2004). However, social support did facilitate faster recovery from mood episodes, also consistent with other studies (Rosenfarb, et al., 2001) and made participants less prone to depression over the course of two years. Longitudinal studies like this one are rare and highly valuable in spite of it being limited by a small sample size.

Rosenfarb and colleagues (2001) looked at BD patients' relatives and their affective style in relation to the quality of social support that they may be capable of providing. Findings from this study suggest a direct link between relapse and the type of support given by the family. Relatives of patients who relapsed were more critical and yet supportive in comparison to relatives of patients who did not relapse. Similarly, Cohen and colleagues (2004) followed up 52 bipolar outpatients for a year and found that perceived low social support had a direct effect on episode recurrence. Moreover, social support did not buffer the effects of stress and thus higher levels of stress combined with perception of low availability of social support were associated with recurrence, independently of clinical history and medication compliance. This suggests that the perception of less available support is a risk factor in itself or it can be a psychological resource to protect against relapse. However, this study too has the limitation of a relatively small sample size.

Similarly, Johnson and colleagues (2003) reported that social support is crucial to achieve a full temporary recovery. They examined 94 bipolar patients and compared those who attained a full recovery with those in partial recovery. Bipolar patients

who experienced full inter-episodic remission reported higher degree of perceived social support than those in partial remission between episodes. Their results also showed that patients who experience relapse of bipolar illness at 1-year follow-up more commonly report low perceived social support. The findings can imply that partial remission and low perceived social support could have similar underlying causes such as personality factors that make someone more vulnerable to mood dysregulation and to underestimate the available support. Furthermore, this study highlights the importance of the subjective experience of social support as a protective factor, rather than the actual objective or instrumental support. High quality support is thought to act as a protective factor against negative situations but the evidence suggests that it is the interpretation of social support and the perception of availability that matters the most (Morris, 2006).

Additionally, it has been suggested that significant life events specifically predict mania (Hays et al., 1998; Reilly-Harrington et al., 1999; Johnson et al., 2008). For example, goal attainment life events predict increased levels of manic symptoms. In a study conducted by Johnson et al. (2008), a sample of one hundred twenty-five bipolar patients was prospectively assessed with the Life Events and Difficulties Schedule. Participants were interviewed once a month over a period of approximately 27 months so that change in symptoms could be evaluated. The clearest findings indicated that goal-attainment life events predict more occurrence of manic symptomatology over time, whereas negative life events predicted increased appearance of depressive symptoms. Studies like this are particularly valuable because the findings suggest that understanding the processes guiding the

development of mania and depression separately is important.

Furthermore, Garino et al. (2005) examined the association between bipolar disorder and traumatic life events and found that these kinds of events are highly prevalent amongst bipolar patients, being associated with both the onset of episodes and poorer outcomes. Similarly, Goldberg and Garino (2005) investigated the development of post-traumatic stress disorder in a sample of bipolar patients with a history of severe childhood abuse. Unsurprisingly, their findings suggested that childhood trauma is associated with poorer outcome characterized by lifetime substance abuse, increased suicidal behaviour and rapid cycling. Also, Kauer-Sant'Anna et al. (2007) assessed 163 bipolar outpatients for substance abuse or dependence, anxiety comorbidity, rapid cycling and lifetime psychosis. Participants were split into two groups, one with and one without lifetime exposure to traumatic events. The traumatic events included in the analysis were sexual, physical and psychological abuse, loss of a close relative, car or personal accident and witnessing a life-threatening situation. Results supported the notion of high reactivity to stressful events amongst BD patients given that those with a history of difficult life events were more likely to abuse alcohol, suffer from anxiety or present post-traumatic stress disorder. However, one limitation of these studies is that the assessment of traumatic events via reports of past experiences are thought to be unreliable due to bias and poor insight (Johnson, 2005b). Nonetheless, research into this area has provided considerable evidence of early life events being an important variable to bipolar onset, course and outcome given the long term effects they have on adult functioning and well being.

One interesting postulation with regards to the prevalence of reported stressful life events in bipolar disorders is the stress generation theory. According to the latter, depressed individuals tend to have neurotic personality traits that promote generation of stressful life events. To test this within individuals at high risk of developing bipolar, Ostiguy and colleagues (2009) recruited 37 participants whose parents suffer from bipolar disorder. This group was compared to 33 low risk individuals whose parents did not have an affective disorder. The stress generation theory was not supported by the findings and high-risk participants did not experience more frequent interpersonal and self-dependent stressful events. However, they did seem exposed to a higher degree of environmental vulnerability since on average they reported more severe independent life events. This is very interesting since it provides insight into why bipolar disorder seems to run in families. Those raised by a bipolar parent are vulnerable to the disorder because they are exposed to greater and chronic stress associated to the parent-child dysfunctional relationship. Furthermore, the parents diagnosed with bipolar (from this same sample) did report higher incidence of stressful life events whose occurrence depended on them. In sum, this study's findings indicate that the children of those diagnosed with bipolar do not generate stress but are exposed to it, whilst their parents appear to generate it.

Sanchez-Moreno et al. (2009) reviewed the empirical evidence regarding the associated factors that predict low functioning and disability in bipolar patients. They concluded that social support impacts on the outcome of bipolar disorder, but subsyndromal symptoms related to both mania and depression, impact even more since they hinder both social and occupational functioning. Thus, it is important to

better understand what lies beneath these symptoms and improve recognition and management. Greater understanding of the affect regulation process within this disorder could prove beneficial to management of subsyndromal symptoms, and thus to improvement of individual's overall functioning.

But perceived social support is not only important to the outcome of bipolar disorder, in a recent study about risk of developing bipolar, Schwannauer and colleagues (2011) established that perceived social support directly predicts risk of developing bipolar disorder. Thus the perception of absence of social support is a risk factor to develop severe mood instability. In this study, 549 students were assessed to identify risk factors to develop bipolar disorder. Participants were assessed for perceived social support, amongst other variables, and the results established that the lack of perceived social support directly impacts on individual proneness to developing severe mood instability. However, the lack of perceived social support is mediating the relationship between participants' recurrent difficulties in relating to others (interpersonal problems) and indicators of risk of BD. From this, it could be inferred that dysfunctional patterns in interpersonal interactions would be related to attachment organization, however the role of attachment in this sample was outclassed by other variables and was not included in the statistical analysis. Thus more research is needed to investigate the impact of attachment within bipolar individuals or those prone towards developing severe mood instability as it is observed in bipolar disorder.

So, empirical research in environmental factors within bipolar disorder suggests that

negative life events predict faster relapse, episode onset and slower recovery, whilst social support is unable to buffer for such effects, perhaps because it is the individual's perception of social support rather than the actual instrumental available social support that counts. Moreover, negative life events alone only account for a small proportion of the variance observed in bipolar patients. It is the interaction of such events with other risk factors or vulnerability traits that can more accurately explain the observed bipolar phenomena. For example, negative life events play a more prominent role in the precipitation of a mood episode in individuals with a negative cognitive style (Johnson, 2005b). Equally, one must remember that bipolar disorder is associated with occupational impairment as well as interpersonal difficulties beyond the acute phases of the illness due to subsyndromal symptoms (Sanchez-Moreno, 2009). This paints a rather unfavourable picture that could serve to explain why bipolar patients are highly reactive to life events. High rates of divorce, unemployment, stigmatization and victimization can most certainly keep bipolar sufferers at higher levels of stress more or less permanently, thus when assessed about negative life events they are likely to report more of these than people with no mental illness (Johnson, 2005b).

In sum, although literature suggests that life events and traumatic events play an important role in the onset, course and relapse of bipolar disorder, the relationship is not at all straight forward, nor mediated by social support, because stress and illness vary with pre-existing vulnerability factors (Johnson, 2005b). It would be inaccurate to propose that life events elicit emotions and as a consequence impact mood regulation and catalyse mood episodes. However, studying the mechanisms

underlying such increased life event reactivity is crucial to broadening our understanding of bipolar disorder. For example, to Fonagy et al. (2004), an individual's capacity to react and face life events would be related to their early attachment relationships, as it is within these that emotion regulation capacities begin to unfold and reflective functioning develops. Thus, research on this area is much needed, with explicit efforts being made to better understand the role that interpersonal variables play in severe mood disorders such as bipolar.

1.6.2 Psychological risk factors for bipolar disorder

The role of cognitive processes in bipolar disorder has been increasingly of interest, due to the need to better understand the cognitive vulnerabilities and information processing biases characteristic of the disorder. Early research has been largely based on theories of unipolar depression that suggest depressed individuals present maladaptive beliefs about the self and others, which makes them vulnerable to suffer from depression (Alloy et al., 2005; Adams et al., 2014). On the basis of this, researchers have focused on understanding the cognitive predispositions and personality traits characteristic of bipolar disorder, as well as clarifying to what extent bipolar and unipolar individuals are similar and thus can be treated with similar approaches.

1.6.2.1 Cognitive biases and personality traits in bipolar disorder

There has been growing interest in the role of cognition in bipolar disorder,

specifically in whether individuals diagnosed with BD are comparable to those with unipolar depression with regards to the expressed cognitive biases believed to trigger and maintain low mood. Dysfunctional attitudes and how these interact with environmental variables to prevent or predict onset, alter course and impact outcome are particularly of interest. Examining the cognitive factors of bipolar disorder is crucial to better understand the observed life event reactivity in bipolar individuals (Reilly-Harrington, 1999). Similarly, given that subjective reporting of social support seems more influential in bipolar disorder than the objective availability of it, one could assume that certain cognitions or other psychological variables are linked to the tendency to underestimate or underreport the available social support.

As a general consideration, empirical research on this area indicates that cognitive style in bipolar disorder is influenced by mood and type of assessment. Whether the participant is undergoing a mood episode impacts on self-reported cognitive functioning, whilst whether assessment is done with explicit or implicit measures matters because participants seem to exhibit more positive cognitive styles when assessed by explicit measures and more negative ones when assessed by implicit measures (Alloy et al., 2005). In the light of this, one can assume that implicit measures tap into automatic-unconscious processes, whilst explicit ones are vulnerable to defensive mechanisms.

Dysfunctional attitudes are believed to underlie negative cognitive biases observable in mood disorders. The concept of dysfunctional attitudes refers to the pervasive negative beliefs, or common assumptions, that depressed individuals hold in relation

to the self, the world and the future. These distinctive perceptions constitute a risk factor associated to the onset and maintenance of depression (Weissman & Beck, 1978). Moreover, it is believed that dysfunctional attitudes correlate with both intensity and relapse of depressive mood. From this perspective it is understood that emotions come as a result of specific cognitive processes, thus are determined by underlying cognitions. The meaning that an individual ascribes to a given situation greatly influences how he feels about it. For example, certain individuals have a tendency to think irrationally and these irrational beliefs cause a variety of distressing emotional responses. This tendency to misinterpret situations reflects a well-learned distorted set of irrational views, believed to be involuntary and automatic (Weissman & Beck, 1978). To examine where these views are learnt from is crucial to deepen our understanding of mood instability.

Understanding the cognitive biases characteristic of bipolar disorder and learning whether these are similar to those observed in unipolar depressed patients or not has prompted a vast amount of research. Reilly-Harrington and colleagues (1999) examined the interaction of cognitive style and life event reactivity in predicting depressive and hypomanic symptoms in 49 bipolar patients, 97 unipolar depressed patients and 23 non-diagnosed controls. Bipolar patients' negative attributional styles, dysfunctional attitudes and negative self-referent information predicted the number of negative life events reported by participants. Moreover, the interaction between negative cognitive factors and adverse life events predicted the development of symptomatology related to depression or mania. These findings suggest that bipolar individuals are vulnerable to depression and mania due to their negative cognitive markers, which underlie the way they react when faced with negative

situations. Furthermore, the findings support the manic defence hypothesis (Abraham, 1911 as cited by Bentall, 2003) given that they suggest that similar cognitive processes trigger both depression and mania. However, the results pose an interesting question with regards to what factor or factors may be responsible for determining which type of episode a bipolar individual will experience at a particular point in time. Thus other possible mediators of the relationship between cognitive vulnerabilities and expressed symptomatology should be examined.

Similarly, in a more recent study Adams and colleagues (2014) found that dysfunctional information processing determined by negative beliefs about the self seems to be a cognitive risk factor for both unipolar depression and bipolar disorder. In this sample, bipolar individuals (N=66) were comparable to unipolar depressed patients in that they reported and recalled more negative and fewer positive self-referent adjectives than non-diagnosed individuals. Moreover they also reported more negative and fewer positive behavioural predictions than controls (N=58), finding that was interpreted as them thinking to be more likely to engage in negative behaviours than in positive behaviours. It is important to note that these associations were partially, yet not fully, mediated by a negative current depressive mood, thus suggesting that a negative self-referent information processing bias is a risk factor in individuals diagnosed with bipolar disorder irrespective of the current mood state.

In another recent study Alatiq and colleagues (2010) examined whether hypomanic dysfunctional beliefs, accurately identified bipolar patients. Group comparisons between 40 remitted bipolar patients, 20 remitted unipolar patients and 20 healthy

controls were carried out. Participants were assessed for hypomanic dysfunctional attitudes. The results indicated that remitted bipolar patients presented more hypomanic dysfunctional beliefs than remitted unipolar patients and healthy controls. Specifically the results showed that remitted bipolar individuals have more self-catastrophic beliefs related to fear of failure, experience more activation and elevation thoughts, thus engage in high moods and seem more prone to thinking that others would react negatively to their elevated moods. However, there were no significant differences across groups with regards to dysfunctional attitudes as measured by the dysfunctional attitudes scale (DAS; Weissman & Beck, 1978). This is suggestive of dysfunctional attitudes not being observable during remitted phases of mood disorders, whilst hypomanic attitudes prevail in bipolar patients even during remission. Authors propose that the observed stable underlying subtle activation could be explained by the highly ambitious nature of bipolar individuals, which results from their fear of failure.

On the contrary, Thomas and colleagues (2009) examined whether dysfunctional attitudes were characteristic of all phases of bipolar disorder. Their results supported the manic defence hypothesis indicating that manic patients, depressed bipolar patients and remitted bipolar patients all experienced higher levels of dysfunctional attitudes than healthy controls and did not greatly differ amongst themselves. It is important to note that all the participants in this study were assessed with an implicit measure, thus allowing for the conclusion that all phases of bipolar are associated with the type of dysfunctional attitudes often seen in depression, suggesting that depression is an important feature of vulnerability to bipolar disorder. Similarly,

Goldberg and colleagues (2008) reported findings supportive of the manic defence hypothesis. They assessed dysfunctional thought patterns in 34 bipolar manic patients, 35 unipolar depressed patient and 29 healthy controls. Unipolar depressed patients had significantly higher DAS scores than the other two groups, whereas bipolar patients' scores were in the middle, between depressed and healthy controls. Moreover, significant correlations surfaced between mania and the DAS total score, the performance DAS subscale and the approval DAS subscale. This indicates that manic patients appear negativistic irrespective of the severity of the present manic symptoms and the absence of depressive symptoms. Results could be interpreted as elevated mood being an attempt to compensate for underlying low mood. It is important to note that there were no other significant correlations between the DAS and healthy controls or unipolar depressed patients. Thus, these findings suggest that negative dysfunctional attitudes prevail during mania too and should be targeted during all phases of bipolar disorder.

In spite of the evidence suggesting that similar dysfunctional attitudes underlie all phases of bipolar disorder, Mansell (2006) sought to identify specific cognitions that may trigger mania and hypomania. He theorised that bipolar individuals' interpretation of internal states triggers activation like behaviours, emotions and cognitions and hinders self-regulation capacities. The way bipolar or prone to bipolar individuals appraise mood, immediately generates a response style that fosters more activation or inhibition, thus preventing normal self-regulation. So, individuals with bipolar disorder or prone to it, will interpret events as either extremely positive or extremely negative, leading to the development of manic or depressive symptoms respectively. Appraisals with regards to self-activation are crucial to distinguish

between bipolar patients and healthy controls. Bipolar patients reported to believe that they have little control over, or responsibility for, their changes in mood, way of thinking and consequent behaviour. However, in spite of their belief of little control, they demanded of themselves high levels of control over these factors. Moreover, specifically with regards to hypomania and mania, bipolar individuals seem to think that it is important to respond to their positive moods with activation like behaviours. Lastly, bipolar individuals reported an excessive need for external validation and approval, thus wanting to be seen positively by other people, whilst they fear being perceived by others or themselves as a failure, which supports other findings indicative of bipolar individuals being extremely ambitious and concerned with personal success (Alatiq et al., 2010). Based on this, Mansell and colleagues (2007) proposed a theoretical cognitive model to account for mood swings as seen in bipolar disorder. Grounded upon the available literature, the authors describe how individuals with bipolar disorder interpret changes in their mood as either extremely positive or negative. The valence of the appraisal determines the behavioural component that follows up. Behavioural responses aim to exert control and can be activating or deactivating, thus promoting mania or depression. But what underlies the appraisal and correspondent behaviour is a mixture between beliefs about the self, the world and others, and the capacity to regulate affect. This interesting theoretical proposition does not attempt to differentiate between cognitions specific to mania and those specific to depression. This model is more inclusive and highlights the occurrence of complex patterns, cycles of affect and behaviour within bipolar disorder. For example, it acknowledges that negative appraisals can also lead up to mania due to an intolerance of the depressed mood that accompanies these

types of interpretations. Individuals can strive to suppress negative feelings with activating behaviours that promote high levels of activation, positive affect and ultimately are related to mania.

Another interesting study by Francis-Raniere and colleagues (2006) explored cognitive and personality vulnerabilities, characteristic of bipolar disorder. The main objective was to determine whether a particular personality style was present within bipolar individuals and whether life event reactivity seemed congruent with the identified personality style and its associated cognitive characteristics. A sample of 106 bipolar patients was assessed throughout a 4-month period. Participants provided information with regards to their personalities and significant life events. Results identified two personality styles, one characterized by thoughts around self-criticism and performance evaluation, which is consistent with previous findings highlighting bipolar individuals' concerns with ambition and achievement (Alatiq et al., 2010; Mansell, 2006), and one focused on attachment relationships. The first personality style interacted with both negative and positive congruent life events to predict increase in either depressive or hypomanic symptoms respectively. In contrast, the personality style characterized by an underlying social interest seemed to protect participants from depression, which is consistent with the links that have been established between perceived social support and decreased mood instability. In sum, two main personality styles were identified amongst bipolar individuals. Those focused on achievements, high self-standards and self-criticism showed increased life event reactivity and vulnerability to both depression and hypomania when experiencing a congruent significant life event. On the other hand, those concerned

with establishing personal relationships seemed more resilient and managed to buffer against depression and lessen life event reactivity. This study's results raise the question of what may be underlying the development of one or the other personality styles, whilst they highlight the central role that relationships and connectedness play to support, encourage and promote effective emotion regulation.

Scott and colleagues (2000) identified perfectionism as a vulnerability trait to mood instability. They compared a sample comprised by 41 euthymic bipolar patients with a group of 20 healthy controls. Participants completed measures about depression and dysfunctional attitudes amongst others. Bipolar patients demonstrated significantly higher levels of dysfunctional attitudes, particularly perfectionism and need for approval, consistent with other findings (Alatiq et al., 2010; Mansell, 2006; Francis-Raniere et al., 2006). In fact, the perfectionism score from the DAS correctly classified over 80% of the subjects into the bipolar or control groups, which highlights the importance of this trait as a vulnerability factor to develop mood instability. Moreover, bipolar individuals seemed more dependant on others, presented difficulties recalling autobiographical events in detail and showed impaired problem-solving skills. The marked tendency to remember autobiographical situations in an overly general fashion proved to also be a very robust predictor of group membership. Contrary to other findings suggesting that cognitive deficits were only present in acute phases of the disorder and fully reversed during remission (Martinez-Aran et al., 2000), Scott and colleagues (2000) found that the level of cognitive dysfunction in euthymic patients was positively correlated with the level of morbidity, which means that the greater cognitive dysfunction the

more illness episodes that had been experienced by the individual, emphasizing the association between severity of illness and degree of cognitive impairment. However, dysfunctional attitudes present during remitted phases of the illness could also indicate the incidence of prodromal or subsyndromal symptoms in this particular sample. For example, in more recent studies researchers found no presence of dysfunctional attitudes in remitted bipolar patients (Lex et al., 2008; Alatiq et al., 2010).

In sum, research with respect to cognitive and personality factors that influence the development, course and outcome of bipolar disorder suggests that dysfunctional attitudes are associated to all phases of bipolar disorder. Several studies' findings support the manic-defence hypothesis given that the same cognitive processes seem to underlie depressive and manic phases of bipolar disorder, thus suggesting that hypomanic/manic phases of bipolar are not simply the opposite of negative depressed stages. More specifically, research suggests that severe mood instability as seen in bipolar, is associated to a negative self-referent information processing bias, similar to the one that has been identified within unipolar depressed patients. Moreover, bipolar individuals are characterized by a hypomanic personality style, with underlying hypomanic attitudes such as perfectionism, self-catastrophic beliefs, fear of failure, cognitive activation and elevation, increased ambition and exceedingly high personal standards.

Furthermore, the available research highlights the association between cognition and emotion regulation whilst it places particular importance on the individual's

interpretation of changes in mood. These subjective interpretations tend to be conflicting and extreme, which hinders the individual's capacity to regulate affect. Hence one could argue that in bipolar disorder, cognitive biases do not elicit negative emotion, but they hinder emotion regulation capacities, leaving an interesting gap to be investigated as to what other factors impact on bipolar patients' emotion regulation ability. For example, with regards to the developmental aspects that could be implicated, attachment style, levels of reflective functioning and their influence in emotion regulation are important developmental factors worth looking at, as they might help clarify the origin of cognitive biases present in bipolar disorder.

1.6.3 Developmental risk factors for bipolar disorder

From the literature reviewed so far it is clear that the current environmental context, cognitive style and personality traits interact and can represent a risk factor for the onset, course and expression of bipolar disorder. However, there is still one important area to take into consideration and this is the developmental history of individuals suffering from severe mood dysregulation. How attachment organization impacts on reflective functioning acquisition and on emotion regulation ability in bipolar disorder has been understudied. However, there are initial findings involving these factors, that suggest attachment organization and its associated consequences deserve further exploration (Alloy et al., 2005).

1.6.3.1 Attachment organization, reflective functioning and emotion regulation in bipolar disorder

Attachment organization and vulnerability to bipolar disorder

To date, the role that attachment organization plays in the development and course of bipolar disorder has been understudied (Alloy et al., 2005, 2006; Greenberg et al., 2014). However, it has been proposed that attachment interacts with stressful life events to influence the development of severe mood instability, as experienced in bipolar disorder (Fonagy et al., 1996). Sarkar and Adshead (2006), stress the importance of attachment organization in relation to the development and acquisition of affect regulation skills, stating that insecure attachment fosters rapid cycling between states of hyperarousal and withdrawal, resulting in severe disorganisation of emotions and behaviours.

The available literature exploring the relationship between vulnerability to bipolar disorder and attachment organization is limited. For the most part, the reviewed studies addressed attachment organization in already diagnosed bipolar patients. Yet, from this review it was gathered that the literature is mainly divided in two lines of research: one based on the reported early experiences of bipolar individuals' with their parents, and the other based on the assessment of adult attachment. The first line of research is then based upon retrospective designs that rely on participant's recollections of early experiences, whilst the second is based upon adult's self-reported accounts of their current relationships. Despite methodological limitations

such as reduced samples and the use of several different self-reports, the findings indicate that social relationships are compromised in individuals with bipolar disorder, whilst insecure attachment organization predominates in this population. Furthermore, the evidence suggests that attachment is important to aetiology, course and outcome of bipolar disorder (Greenberg et al., 2014; Morriss et al., 2009).

According to Fonagy et al. (1996) bipolar disorder is highly associated with insecure attachment as measured by the Adult Attachment Interview. More specifically they found that derogative narratives about early experiences, which are characteristic of dismissing insecure attachment, were associated with hypomanic and manic states.

However, Morriss et al. (2009) highlighted anxious insecure attachment as the attachment organization characteristic of bipolar disorder. They found various associations between insecure attachment and a diagnosis of bipolar disorder type I. In their study Morriss and colleagues divided a 107 participants sample in 3 groups: bipolar depressed, bipolar manic and bipolar euthymic. These three groups were compared to a control group, whilst researchers held the hypothesis that attachment style as measured by the Relationships Questionnaire (Bartholomew & Horowitz, 1991), was independent to mood and thus bipolar groups would show no significant differences between themselves, but they would show significant differences from the control group. However, according to their findings, measures of attachment style can be susceptible to mood. Euthymic and depressed bipolar disorder participants were less secure than healthy controls but the difference in mean secure attachment between mania and healthy controls was small. Furthermore, preoccupied and

dismissing attachment styles were much affected by mood. Preoccupied attachment was greater in both manic and depressed individuals than in euthymic and healthy control participants, whilst dismissing attachment was lower in the depressed group and non-significantly high in the mania group. Lastly, with regards to anxious insecure attachment they found that all bipolar disorder groups showed more anxious attachment than healthy controls. Thus, they concluded that only anxious attachment style seemed to be a trait feature of bipolar disorder, since it is unaffected by mood. In addition, because no association between attachment and measures of the course of illness was found, authors suggested anxious-insecure attachment as a vulnerability factor for developing bipolar disorder. Similarly, Harnic et al. (2014) compared attachment organization in a sample of 90 outpatients diagnosed with bipolar or cyclothymia and a sample of 86 healthy controls. They utilized self-report questionnaires to assess attachment and temperament and found significant differences across clinical and non-clinical participants. The clinical sample reported predominantly insecure attachment, whilst the non-clinical controls reported mainly secure attachment. In the control group, about half of the participants were determined to have a secure attachment, whilst most of the clinical sample was found to have either preoccupied or fearful attachment. The results suggest that bipolar individuals display a relational style based upon anxiety and insecurity.

In one of the two studies found with a high-risk of developing bipolar sample, Doucette and colleagues (2013), reported no significant differences of attachment organization between children of bipolar parents and children of healthy controls. They explored perceived attachment to their parents across a sample of 221 children

with a parent diagnosed with bipolar and 63 controls. According to this study, there may be no abnormalities in attachment among the ‘at-risk’ sample, given that the perceived quality of relationships with their parents was comparable to that reported by controls. However, DeMulder and Radke-Yarrow (1991) had previously reported higher insecure attachment in a similar sample (offspring of BD). Assessment of the quality of attachment between bipolar mothers and their offspring (112 dyads) was one of the objectives of DeMulder and Radkey-Yarrow’s longitudinal project. They reported that 67% of bipolar mothers’ children were categorized as insecurely attached when assessed by the Strange Situation procedure (Ainsworth et al., 1978). Mothers of insecurely attached children were described as pessimistic, tended to show less affection and were more likely to express high levels of negative affect. Furthermore, insecurely attached children were described to present similar characteristics, appearing less warm, more irritable and being easily discouraged. Thus, from these two studies, it remains unclear whether or not attachment is mainly insecure within this particular at-risk population.

In sum, it is difficult to compare the literature regarding attachment and bipolar disorder or vulnerability to it given that there is little overlap in the methods used in each study. A lot of variation in terms of the utilized attachment questionnaire was observed, which implies that different types of attachment relationships are being assessed (Greenberg et al., 2014). For example, some studies assess attachment to parental figures based upon recollection of childhood experiences, whilst others assess current attachment to significant others or friends. Furthermore, most studies exhibit important methodological limitations, including small samples and not

controlling for mood state in spite of using clinical samples. Nevertheless, in spite of these limitations, the reviewed literature seems to consistently highlight anxious insecure attachment as the type of attachment characteristic of this population (Korver-Nieberg et al., 2014). Yet, more research on this area is necessary to better understand the role of attachment organization in risk of developing severe mood instability.

Emotion regulation and vulnerability to bipolar disorder

The way in which anxious insecure attachment influences the development of bipolar disorder is thought to be linked to the association that attachment holds with affect regulation development (Dozier et al., 1999). Affect regulation can be seen as the regulation of all affective states, including emotion and mood regulation (Aldao et al., 2010). Just until recently there has been a rising effort to incorporate emotion regulation into models of psychopathology, including bipolar disorder (Aldao et al., 2010), which is surprising given that affect dysregulation is implicated in over half of the DSM-IV axis I disorders and in all of the axis II disorders (Gross & Levenson, 1997).

Studies in bipolar disorder and emotion regulation suggest that both risk of and a diagnosis of BD are linked to affective instability. Thus it is considered that inadequate emotion regulation is a trait in bipolar disorder and a vulnerability marker to developing it (Henry et al., 2001). Moreover, increased positive emotion reactivity has been also established as a vulnerability marker and trait in both at risk and

clinical samples respectively, whilst some authors suggest that bipolar individuals' reactivity to negative emotion seems less specific to the disorder or risk to developing it (Johnson et al., 2007; Gruber et al., 2011).

Preceding affective instability was assessed within a sample of 148 participants, aiming to establish affect lability (i.e. short-term mood fluctuations) as a core component of bipolar and borderline personality disorder. The sample was divided into 4 groups, 29 borderline patients, 14 bipolar patients, 12 patients who met criteria for both disorders and 93 who met criteria for other personality disorders. Bipolar patients showed increased affect lability thus had significantly higher scores for depression, elation and an increased tendency to alternate between these two states. Furthermore, lability was also observed between euthymia and depression, or elation, suggesting the presence of a trait-like pre-existing or residual instability between mood episodes. Moreover, bipolar and borderline personality disorder seemed similar with regards to lability between anxiety and depression, but not sufficiently comparable to be able to consider borderline personality disorder an attenuated mood disorder (Henry et al., 2001). In sum, although arguably the sample size presents a limitation and results should be interpreted cautiously, this study highlights persistent affective instability as a characteristic of bipolar individuals, given that it is short-term and not only visible during mood episodes but during euthymic phases too.

Another line of investigation into mood instability in bipolar disorder is to assess the specific strategies that individuals use to regulate emotions. In a high-risk study of parents with bipolar disorder and their adolescent children, Jones et al. (2006)

established that offspring of bipolar parents are at elevated risk of the disorder given that they present high rates of mood symptoms, use of abnormal strategies to regulate affect and exhibited unstable self-esteem. They compared 25 children of bipolar parents (CBD) to 22 children of healthy controls parents (CC) across several variables including measures of self-esteem stability, dysfunctional attitudes, and coping strategies in response to low mood (i.e. rumination, adaptive coping and risk taking behaviour). Interestingly, CBD showed significantly higher self-esteem instability, rumination, maladaptive coping and risk taking behaviour but no differences were found for dysfunctional attitudes. This could suggest that the use of abnormal strategies to regulate emotion and inconsistent self-esteem represent a risk factor for developing bipolar disorder whilst dysfunctional attitudes do not.

Similarly, Green et al. (2011) established that the use of maladaptive emotion regulation strategies is an important predictor of depressive symptoms unique to bipolar disorder. This study compared 105 individuals diagnosed with bipolar disorder, 124 unaffected biological relatives and 63 healthy controls across measures of maladaptive (e.g. rumination, self-blame and catastrophizing) and adaptive emotion regulation strategies (reappraisal, refocus and planning). Results indicated that bipolar individuals use maladaptive strategies often, whilst adaptive ones are a lot less frequently employed. A diagnosis of bipolar disorder was best predicted by increased rumination and decreased use of refocus on planning. Furthermore, rumination was also a key predictor of hypomanic personality amongst individuals diagnosed with BD. The groups of unaffected biological relatives and healthy controls showed an increase use of catastrophizing and self blame, along with

reduced use of adaptive strategies, which altogether predicted depressive mood, anxiety and stress. Furthermore, in the group of unaffected biological relatives, hypomanic traits were predicted by an increased use of catastrophizing as a regulatory strategy. Together these associations emphasize the importance of using maladaptive strategies to regulate emotion. In the case of bipolar disorder, rumination stands out as an important predictor of low mood, whilst catastrophizing was an important predictor of mood disturbances in those at risk of developing bipolar disorder. Lastly, self-blame was an important predictor of psychological distress in members of the general population. According to Green and colleagues (2011), impaired use of adaptive strategies could suggest a lack of ability due to inherited deficits. However, it is also possible that this lack of competence implies a different deficit, for example poor reflective functioning, rather than an innate neurocognitive condition. Wolkenstein et al. (2014) came to similar conclusions after evaluating cognitive emotion regulation strategies across euthymic bipolar individuals (N=42), participants with a history of depression (N=43) and healthy controls (N=39). In this sample too, bipolar individuals reported increased use of rumination, catastrophizing and self-blame, along with reduced reappraisal and putting into perspective. However, no differences were found between euthymic bipolar participants and depressed ones, which suggests that similar patterns regarding emotion regulation underlie these two mood disorders. Furthermore, the fact that euthymic bipolar patients constituted this sample allows for conclusions to be made regarding the observed choice of strategies to regulate emotion; it would seem that this tendency to use maladaptive emotion regulation strategies is more of a constant pattern, uninfluenced by mood, that could potentially influence the

recurrence of affective episodes.

Although rumination has been persistently found to be associated with the onset and maintenance of negative emotion in bipolar disorder and in proneness to it (Green et al., 2001; Jones et al., 2006), less is known with regards to this strategy in relation to positive emotion. Gruber et al. (2011) examined the role of rumination about positive emotion in BD by comparing 39 bipolar individuals to 34 healthy controls. As expected, bipolar individuals used rumination about negative emotion more than controls. However, they also exhibited more rumination about positive emotion than healthy controls. But interestingly rumination only correlated with more depressive episodes, and not with mania. To further understand positive emotion in bipolar disorder, Gruber, Harvey and Purcell (2011) examined emotion reactivity and emotion recovery in bipolar I individuals. Four small samples were recruited, 23 participants diagnosed with bipolar I and 24 healthy controls for the first part of the study, and another 23 bipolar participants along with 25 non-clinical controls recruited for the second part. Participants in the first study were shown a series of films that aimed to elicit neutral, negative and positive emotions, whilst experiential and physiological responses were being documented. The group of individuals diagnosed with bipolar disorder reported more positive emotion and experienced increased physiological responses, indicating that bipolar individuals are particularly sensitive to positive-emotion stimuli. For the second study, the groups were compared for emotion recovery after being exposed to the emotional stimuli (same emotion-eliciting short films) but no significant differences were found between controls and bipolar individuals. Collectively these results indicate that bipolar

disorder is associated with increased positive emotion reactivity, both experiential and physiological, but not with impaired emotion recovery. Thus, in this sample participants diagnosed with bipolar disorder did not exhibit problems recovering from intense feelings once the emotional stimuli was no longer present. These findings support the idea that BD is related not only to increased negative emotion reactivity but also to heightened positive emotion reactivity. However, results should be interpreted with caution, as the samples used were small and constitute an important limitation.

Stange and colleagues (2013), examined emotion regulation and cognitive vulnerabilities as predictors of negative mood, in individuals prone to developing bipolar disorder. They screened over 9000 students and retained 98 vulnerable to bipolar individuals, based on their high activation and sensitivity scores. Once more, rumination was included as a predictor of depression along with emotional clarity, which refers to the awareness of one's own mental state. Regressions showed that emotional clarity and rumination mediate the relationship between cognitive vulnerability factors (i.e. dysfunctional attitudes, self-criticism and neediness) and depressive mood specifically in this high-risk sample. As per expected, rumination aggravated negative mood, whilst awareness protected against it, or in other words low levels of emotional clarity seemed to be a risk factor for developing depression. One could argue that emotional clarity is conceptually similar to reflective functioning and more research should be done to better understand why individuals prone to mood instability might lack this emotional awareness. Gruber and colleagues (2014) also examined a sample of euthymic bipolar patients (N=23) in

comparison to 23 healthy controls and whether or not they differed in their ability to use reappraisal to down-regulate their emotions after being presented with an emotional stimuli (positive, negative and neutral film clip). Results showed that reappraisal was associated with decreased emotional reactivity in both groups, when participants were instructed to reappraise. This suggests that euthymic bipolar individuals are just as able as healthy controls to down-regulate their emotions but only when assisted or cued to do so. However, the underlying reason why bipolar individuals fail to engage in positive strategies to regulate emotion on their own remains unclear. These findings could be indicative of emotion regulation ability being a developmental milestone rather than a biological phenomena that seems impaired in bipolar disorder; perhaps everyone is born able to regulate emotions but not everyone goes on to internalize this capacity as part of the self, thus they do not become autonomous and effective in self-regulating emotions. Furthermore, as Gruber et al. (2014) propose, it may be the case that failure of emotion regulation in bipolar disorder is somewhat influenced by poor emotional awareness and work should be directed towards testing these hypotheses and further clarifying the role and nature of emotion dysregulation in bipolar disorder.

Lastly, another study of risk to develop bipolar disorder, Schwannauer et al. (2011) highlighted the importance of dysfunctional emotion regulation as a predictor of risk to develop bipolar disorder. In this study, 549 university students were assessed for risk of developing bipolar, emotion regulation strategies, attachment organization, interpersonal problems, social support and behavioural activation and inhibition. Researchers concluded that one of the two variables that showed a direct effect on

vulnerability to BD was dysfunctional emotion regulation. Participants were assessed by means of the Regulation of Emotion Questionnaire (Phillips & Power, 2007) which consists of four subscales: internal dysfunctional, internal functional, external dysfunctional and external functional. Results indicated that dysfunctional regulation of emotion plays a crucial role by directly impacting on individuals' perceived mood state. Dysfunctional emotion regulation as measured by this questionnaire is characterized by rumination, negative thoughts about the self and others, isolation and aggressive behaviour. Moreover, this study highlights the relevance of social support as a mediator between interpersonal problems and mood. However, within this sample, attachment organization and hypomanic traits were overshadowed and thus it remained unclear what the role of them was with regards to vulnerability to bipolar disorder. Thus further investigation of these factors remains relevant.

In summary, the reviewed research on emotion regulation as a vulnerability factor to bipolar disorder focused on one of three investigation lines: emotional reactivity, strategies used to regulate emotion and emotional recovery. Results indicate that individuals at high-risk present increased reactivity to both positive and negative emotions. Furthermore, there is a lack of use of adaptive emotion regulation strategies such as reappraisal and emotional awareness, whilst maladaptive ones like rumination and catastrophizing are often used. Lastly, there is evidence to suggest that emotional recovery is not innately impaired in euthymic bipolar individuals, in fact these individuals seem just as able to regulate their emotions as healthy controls, when explicitly instructed to do so. However, for the most part, the studies here reviewed have the limitations posed by small samples, and relying on group

comparisons or correlations to analyse the data. Furthermore, little effort is made to tackle the issue of why emotion regulation appears ineffective in these samples. There is a generalized strong emphasis on the cognitive element of emotion regulation and no attention is directed towards the developmental nature of this ability. Thus, it would be beneficial to investigate the developmental underlying factors that relate to emotion dysregulation in individuals at-risk of bipolar disorder. Moreover, it would be desirable to do so in a powerful sample that allows for more sophisticated statistical analysis to be performed. Although there is substantial evidence to support that inadequate emotional responses along with the use of maladaptive emotion regulation strategies predominate in bipolar disorder and seem to be risk factors to developing it, there is still a pending need to better understand the nature of emotion dysregulation in BD and proneness to it.

Reflective Functioning and vulnerability to bipolar disorder

To date, the role that reflective functioning plays in the development and course of bipolar disorder has been largely neglected and understudied (Kerr et al., 2003). Furthermore, in spite of some evidence suggesting that impairments in the capacity to understand mental states may play a role in some bipolar symptoms, the role of reflective functioning as a risk factor to develop bipolar disorder has not been studied. One possible reason for this is that more emphasis has been put on integrating the concept of mentalization to therapies used with psychotic patients or with borderline personality disorder (Kerr et al., 2003; Bateman & Fonagy, 2004). Furthermore, the difficulties in assessing reflective functioning via the RF scale

(Fonagy et al., 1998) impose greater restrictions to researchers. Thus other similar concepts have been favoured to be examined within bipolar samples. Given the lack of literature linking reflective functioning to vulnerability to bipolar disorder, the studies done with similar concepts and bipolar samples will be reviewed for this section.

Although mentalization (RF) is similar to theory of mind (TOM; Premack & Woodruff, 1978) and metacognition (Cartwright-Hatton & Wells, 1997) it is conceptually broader and in fact includes both TOM and metacognition within its definition (Fonagy et al., 1998; Gumley et al., 2013). Mentalization or reflective functioning is then defined in terms of the mechanisms for processing inter-subjective and interpersonal experience. This capacity is in part a cognitive process comparable to insight, namely an individual's understanding of his own internal states which are given meaning and organization not just to enhance self-understanding and regulation, but so they can be communicated to others and interpreted internally. However, it also refers to an emotional process, namely the capacity to hold, regulate, and fully experience emotion, in this sense similar to empathy. Therefore, reflective capacities associate to the development of social relationships (attachment), which are fundamental to mental health (Fonagy et al., 2004).

Lahera et al. (2008) explored theory of mind capacity within a sample of 75 bipolar euthymic patients and 48 healthy controls. Individuals with bipolar disorder showed reduced TOM ability with respect to scores of the control group. In particular,

bipolar individuals showed deficits in verbal ability and sustained attention. The fact that theory of mind seems impaired in euthymic bipolar individuals could be interpreted as this ability being a trait marker for severe mood instability, but further research needs to be conducted to test this assumption. Similarly, Kerr and colleagues (2003) assessed theory of mind across four small samples: 20 bipolar manic individuals, 15 bipolar depressed, 13 bipolar in remission and 15 healthy controls. Results suggested that current symptomatic bipolar patients showed impaired capacity for theory of mind.

From the very scarce literature on TOM in bipolar disorder one can conclude that the processes and structures that enable a person to examine the content of his mind and make judgments about it are relevant to emotion regulation and thus to vulnerability to severe mood dysregulation. Gruber (2011) emphasizes the link between positive emotion experienced during mania and metacognition. She hypothesized that a pattern within metacognitive beliefs can be implicated in a) the engagement that bipolar individuals have with positive emotions and b) the difficulties these patients experience with regards to regulation of such feelings. Thus, she calls for future research to focus on this area.

Sarkar and Adshead (2006) considered the implications of mood dysregulation and highlight that suffering from unstable mood significantly increases the tendency towards disconnection from one self and the world. The experience of unstable mood gives the individual a fragmented sense of self and of others, whilst their unpredictable behaviour generates chaos in their environment. Thus, helping patients

to mentally represent and put into words their feelings is fundamental as it aids with the organization of their inner world, whilst it makes their feelings seem less frightening and more manageable (Fonagy et al., 2004). These theoretical suppositions certainly open the door for a line of research exploring the cognitive and developmental mechanisms essential to the psychosocial maladjustments that bipolar patients experience (Leguay, 2006). The emerging evidence of difficulties in mentalizing capacity (Kerr et al., 2003; Lahera et al., 2008) and its relation to both executive (Olley et al., 2005) and social dysfunction may assist in increasing our understanding of this debilitating illness, and allow for prevention and more effective treatment that favourably influences the quality of life of bipolar patients (Roncone et al., 2002; Fonagy et al., 2004). Therapeutic programs should aim to assist patients in developing reflective function, particularly in the face of circumstances that favour its inhibition, such as engaging in risk taking behaviours (Bleiberg, 2001). Therapy with this aim at its core has appeared successful within borderline personality disorder, and has helped reduce depression, self-injurious behaviour, and hospitalization whilst enhancing psychosocial functioning (Bateman & Fonagy, 2004). Therefore, these few empirical findings together with the therapeutic claims highlight the importance of reflective functioning within mood instability, as much as they emphasize the need for further research to be done.

In sum, it seems fair to conclude that the theoretical literature around reflective functioning was developed at a faster rate compared to the empirical body of work in relation to it. More empirical research to test the theoretical hypotheses that have been put forward is necessary. Furthermore, given that bipolar disorder is nowadays

best understood as emotional experiences that vary within a continuum along with normal experiences, it is important to carry out more research with non-clinical samples. Exploring non-diagnosed samples eliminates the confounding effect of treatment and diagnosis itself (Korver-Nieberg et al., 2014). Lastly, research within robust samples that permit complex statistical analysis to explore the intricate relationships between variables involved in mood instability is needed, as thus far most of the research has been carried out with small clinical samples. Thus, the present study intends to recruit a large community sample in which complex statistical analysis can be carried out and thus more conclusive findings can be claimed.

1.7 Aims of the Study and Research questions

The purpose of this PhD project is to investigate the underlying processes of bipolar disorder by clarifying the nature of affect regulation in individuals prone to developing bipolar disorder, whilst aiming to understand the relationship that attachment organization holds with it and shed light onto whether or not reflective functioning can mediate such interaction.

Aims of the study:

- a) Characterize the nature of affect regulation in ‘at-risk’ of bipolar disorder, by analysing the relationship that it holds with attachment organization and levels of reflective functioning.

- b) Add to the current psychological models for bipolar disorder by using attachment theory as a theoretical framework for understanding vulnerability to bipolar disorder.

Research questions:

- Does attachment directly predict reflective functioning and emotion regulation?
- Does reflective functioning mediate the relationship between attachment and emotion regulation?
- Does reflective functioning predict emotion regulation?
- Does emotion regulation directly predict proneness to bipolar disorder?
- Do attachment and reflective functioning indirectly predict proneness to bipolar disorder?
- Do depression and negative metacognitions associate with increased likelihood of developing bipolar disorder?

Hypotheses:

- Insecure attachment will directly predict both dysfunctional emotion regulation and reflective functioning.
- Insecure attachment will indirectly predict bipolar proneness through dysfunctional emotion regulation.
- Reflective functioning will mediate the relationship between insecure attachment and dysfunctional emotion regulation.
- Reflective functioning will indirectly predict proneness to bipolar disorder through dysfunctional emotion regulation.
- Dysfunctional emotion regulation will directly predict proneness to bipolar

disorder, depressive symptoms and negative metacognitions.

- Depressive symptoms and negative metacognitions will directly predict proneness to bipolar disorder.

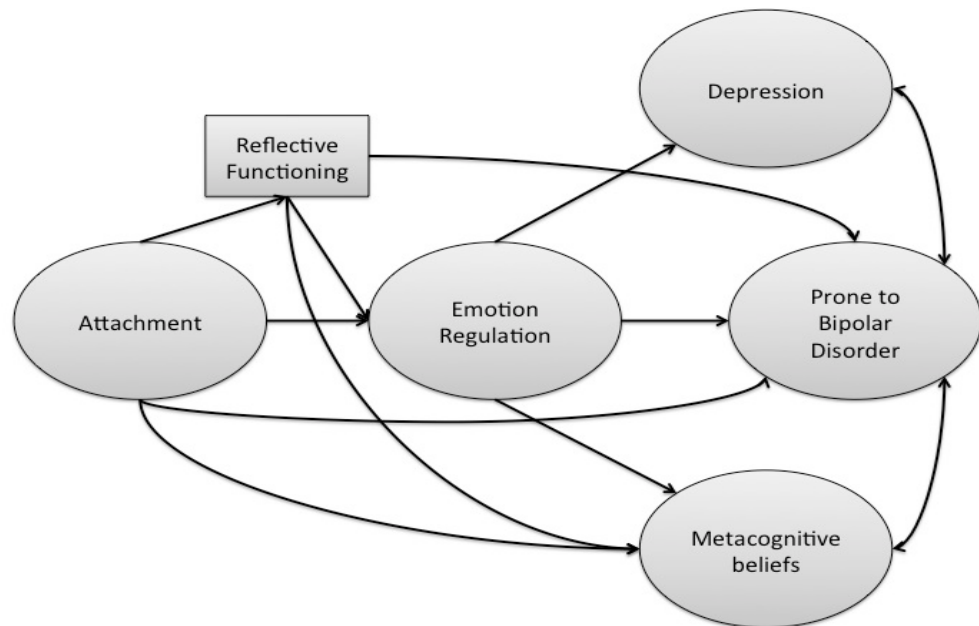


Figure 1.2 A-priori postulated conceptual model of vulnerability to bipolar disorder

1.8 General conclusions from the literature review

Despite the gains from pharmacological approaches, many individuals diagnosed with bipolar disorder still experience poor outcomes. This may be in part explained by the fact that biological models of the disorder are not developed to the extent to which accurate prediction of the course of illness is possible. Therefore, better understanding of the psychology of bipolar disorder is needed. Evidence that highlights the relevance of psychological and environmental factors in the development and maintenance of the disorder has increasingly emerged over the past years. However, these factors overlap and interact with one another, thus providing a

complex picture of the nature of mood instability.

Furthermore, developmental factors have been understudied. There is substantial evidence to support that emotion regulation is dysfunctional in bipolar disorder, however little effort has been directed towards understanding the nature of emotion dysregulation within the disorder. Although some evidence suggests that attachment organization may play a role in the onset, maintenance and course of the disorder, substantial work still needs to be done to better understand the developmental underlying mechanisms of bipolar disorder and how these interact to ultimately be able to more effectively help those who suffer from severe mood instability. Additionally, identification of developmental risk factors may facilitate prevention of bipolar disorder, but work to examine these relationships within a large ‘at-risk’ sample that allows for the formulation of a multivariable model of psychological and developmental variables, remains to be done.

Section 2

*The RF Pilot Study: Development and validation
of an Automated Measure of Reflective
Functioning*

Section 2

Development and validation of an automated measure of reflective functioning

Introduction

One of the main objectives of this PhD project was to develop a measure for Reflective Functioning (RF) that would enable the assessment of RF in a large sample. Most studies using RF have the limitation of using small samples. This is mainly due to the difficulties inherent to assessing the construct by means of an interview, the Adult Attachment Interview (AAI; Main & Goldwyn, 1991), which is time consuming both to conduct and analyse. Furthermore, given the relationship that RF holds with both attachment and emotion regulation, it was important to include it in the set of predictor variables that would go on to constitute the structural equation model to identify risk of developing bipolar disorder. Developing a non-interview based assessment method would allow the present study on bipolar risk to avoid compromising the sample size in view of the RF assessment and its inherent demands.

Reflective functioning is the manifestation of an individual's capacity to mentalize. The concept of mentalization refers to the ability to understand one's own behaviour and that of others in terms of underlying feelings, thoughts, desires and intentions or in other words in terms of intentional mental states (Fonagy et al., 1998). Mentalization and reflective functioning are crucial to emotion regulation and self-organization, therefore interest in the capacity to mentalize and its link to vulnerability to psychopathology has increased in the last decade (Choi-Kain & Gunderson, 2008).

Low reflective functioning has been associated with poor outcome in the treatment of borderline personality disorder (Fonagy et al., 1996), and it has been suggested that low reflective functioning represents an important indicator of vulnerability to other psychopathologies when combined with other risk factors (Fertuck et al., 2012). Consequently, reflective functioning has become a crucial aspect of therapeutic models that aim to increase mentalizing capacities. Improvements in symptoms, emotional recovery, adaptation and better engagement to therapeutic services have been reported as a result of these interventions (Bateman & Fonagy, 1999; McBeth et al., 2011). However, although research has been promising, most studies that assess RF are required to do so in small samples due to the large amount of resources required to measure RF.

2.1 The Reflective Functioning Scale

The term reflective function was introduced to describe the operationalization of the capacity to mentalize (Fonagy et al., 1991). Although other authors have developed questionnaires, observational tasks and projective measures, to assess mentalization (Bateman & Fonagy, 2011), the first and most important measure of reflective functioning is the RF scale (Fonagy et al., 1998).

To assess mentalization in adults with the RF scale, the measure is applied on the Adult Attachment Interview (AAI; Main & Goldwyn, 1991). The scale was developed as part of the London Parent-Child project (Fonagy et al., 1998). One hundred romantic couples, were recruited for this project. Half of the participants were pregnant

women whilst their partners constituted the other half (Fonagy, Steele & Steele, 1991). All participants were interviewed with the AAI and ratings were obtained by having four coders rate each mother interview and three coders rate each father interview. From this sample a nine-point RF scale was determined (1-9). From a subsequent study by the same team of researchers (Fonagy, Steele & Steele, 1991), two additional levels of RF were included into the scale. These were to account for absent (0) or negative (-1) RF and came about as a result of rating interviews from clinical samples. Markedly inappropriate statements such as bizarre, hostile or actively evasive accounts characterize negative or absent RF. It is not uncommon for this level of RF to be overrepresented in clinical populations. To rate an interview for RF, coders must consider four main criteria: 1) how much knowledge and understanding the interviewee has of the nature of mental states, 2) the extent to which participants make the effort to associate mental states of the self and other to behaviours, 3) the level of understanding that the interviewee has of the developmental aspects that may influence mental states, 4) the degree to which the participant recognises mental states in relation to the interviewer. With this in mind, an overall score that ranges from -1 to 9 is given. The lowest score denotes 'negative reflective functioning', whilst the highest score implies an exceptional level of reflective functioning.

2.1.1 Advantages and disadvantages of the RF scale

The main advantage of using the RF scale to assess mentalization is the avoidance of biases characteristic of self-report questionnaires. Interviewing participants about their early experiences allows for detailed information to be gathered whilst avoiding

oversimplifying complex issues. In contrast, self-report questionnaires although very useful in many domains, can misrepresent multifaceted constructs, which produces misleading conclusions. The information obtained through an interview is an indirect verbal assessment of mentalization that encourages participants to communicate more openly about situations involving attachment figures or affectively charged contexts (Taubner et al., 2012). Moreover, the scale shows good interrater reliability, temporal stability and also discriminant validity from personality and self esteem questionnaires amongst other measures (Fonagy et al., 1998; Taubner et al., 2012).

Additionally, this scale is suitable to assess RF in clinical populations. A study comparing non-psychotic inpatients and healthy controls showed that RF was considerably lower for patients with a personality disorder, particularly those diagnosed with borderline personality disorder (Fonagy et al., 1996). Taubner and colleagues (2012) thoroughly tested the psychometric properties of the RF scale and concluded that it is independent of demographic variables such as gender and age, whilst they confirmed findings suggesting that RF is significantly lower in clinical populations. The RF scale is thus considered an established rating system, reliable and relevant with both clinical and non-clinical samples (Fonagy et al., 1991; Fonagy et al., 1998).

However, because this scale is only applicable to narrative-based measures it involves several steps prior to obtaining an overall RF score. To gather and then analyse data from the AAI requires trained interviewers to administer the interview, followed by transcription of the recorded narrative and ultimately coding of the data by previously

trained coders (Fertuck et al., 2012). Moreover, whoever conducts the interviews cannot code the gathered data to minimize biases; thus reliable coders for RF must be engaged. Administering an interview can take up to an hour and a half, whilst an accurate transcription of it can often take up to 8 hours. Coding for RF can take up several hours of work, depending on the length and nature of the transcript. This laborious and extensive process is time consuming and expensive, which prevents researchers from including reflective functioning in larger scale studies and makes it impossible to apply an assessment of the concept in indirect recruitment and distance or online involvement of participants across populations. Thus, a more practical approach to assessing RF seems necessary.

2.2 The Computerized Reflective Functioning measure (CRF)

As previously discussed, there is a necessity to design an alternative scoring system for RF. In an effort to do so, Fertuck and colleagues (2012) developed the Computerized RF measure (CRF). This novel assessment tool focuses on identifying the linguistic markers characteristic of both high and low RF levels by means of computerized text analysis. Because of the speed and accuracy of computer-based technology, large amounts of data can be analysed reliably with CRF. Having a system which is both easier to administer and faster to score, could potentially help advance the validation of RF as a construct, since it would encourage researchers to use it across a broader spectrum of topics.

2.2.1 Development of the CRF

The CRF is based on computerized text analysis that systematically identifies content characteristics from language samples. Content analysis assumes two basic principles: 1) that there is meaning underlying the amount and frequency with which individuals use certain words, 2) that language usage provides enough information for inferences to be made about individuals or groups of people and their characteristics (Fertuck et al., 2012).

Computer based content analysis uses “dictionaries” or lists of words, that have been classified according to similar shared characteristics. The amount and ratio of categories in a particular transcript can be organized by the computer to enable later statistical analysis. The CRF measure was designed according to these principles to facilitate RF assessment without the need of trained raters. The idea is to provide researchers with a computer program that can be downloaded from the Internet and used on any text, once the transcript has been properly formatted for the analysis (Fertuck et al., 2012).

Fertuck and colleagues (2012) used a total of 113 transcripts (40 non-clinical adults and 73 clinical adults) that had been previously rated for RF by trained and reliable coders. Forty participants with no diagnosis of a psychological disorder constituted the non-clinical sample, whilst seventy-three individuals diagnosed with borderline personality disorder and who have had a history of at least one mood disorder, constituted the clinical sample. Using these two samples prevented the development of

a dictionary that could only estimate RF in either clinical or non-clinical populations; in turn the resulting RF dictionary would be valid across a wide variety of samples.

The 113 transcripts were randomly split into three subsets, one subset was used to derive the high and low RF dictionaries by means of computerized text analysis, whilst the other two subsets were used to test the dictionaries' validity using a computer program that calculates the collective frequency of the word markers that constitute each dictionary. To develop the high and low RF dictionaries, researchers used the 'Marker Approach' (as cited by Fertuck et al., 2012) on a third of their available transcripts, which they called the 'dictionary development corpus'. The marker approach allows for manualized coding procedures used with verbal data to be converted into computerized text scoring systems. This method treats word markers as indicators of psychological states and capacities. Word markers tend to be relatively common words that are not necessarily obviously linked to the construct that is being investigated (e.g. and, it, so, not). These indicators and their relative frequency need to be analysed collectively to obtain useful information regarding the stylistic aspects underlying speech.

Within the dictionary development corpus, they identified the extreme cases for both low and high RF by choosing the top and bottom terciles of the distribution. Then, words that were significantly more frequent in one text versus the other were identified and made to constitute the high and low RF dictionaries. Once the dictionaries had been completed, Fertuck and colleagues (2012) proceeded to analyse their 'validation corpus', in other words all the transcripts that were not used to derive the dictionaries.

They analysed these transcripts by calculating the collective frequency of the word markers. Because they realised that RF scores were significantly correlated with the number of words in the AAI, the relative frequency of word markers was multiplied by the natural logarithm of the respective interview length. Lastly, they correlated this number (frequencies of the dictionary words) with the RF scores they had previously obtained from trained raters. Taking all of these factors into account we can derive the mathematical formula to compute CRF:

$$CRF = \ln(\text{Num Words}) * (\text{High CRF Word Markers} / \text{Num Words})$$

The researchers reported a significant correlation ($r=.47$, $p<.0001$) between the RF score given by the trained coders and the CRF obtained using their computerized linguistic marker approach, across the validation corpus of transcripts. Furthermore, they reported significant correlations between manually scored RF and CRF within the transcripts of clinical ($r=.43$, $p<.001$) and non-clinical ($r=.65$, $p<.001$) participants. These results establish the initial criterion validity of the CRF. Moreover, it worth noting that it was the 'high CRF dictionary' made up of 54 word markers the one which provided the most consistent correlations with manually scored RF across all sets of transcripts ($r=.57$, $p\leq.002$ for the validation corpus, the clinical subset and the non-clinical subset).

These results indicate that assessment of RF by means of a computer program is feasible and more importantly reliable (Fertuck et al., 2012). This innovative way of assessing RF signifies a huge improvement to the process of obtaining an overall RF

score. However, another major consideration remains, and that is the data collection. Still needing to rely on interview-based measures, such as the AAI (Main & Goldwyn, 1991), is a major limitation due to two main aspects, 1) interview-based assessments usually need to be administered by trained interviewers and 2) interviews need to be transcribed verbatim and formatted prior to being able to run the computerized analysis.

In summary, despite the valuable development that the CRF implies to the assessment of reflective functioning, conducting and transcribing interviews remains time consuming and pose a challenge. Thus, the present study aimed to investigate the possibility of an online-based administration of six demand questions from the AAI to assess RF. An online administration would involve no transcription of recorded narratives and furthermore it could be scored using the computerized RF measure described above. Therefore, this new online RF assessment would become a fully automated process and thus more portable and feasible to be used in large scale studies.

2.3 The automation of the assessment of RF

To fully automate the assessment of RF, the feasibility of combining an online assessment with the CRF (Fertuck et al., 2012) rating method was evaluated in a pilot sample of 22 participants. To test for associations between this new assessment and the traditional method, AAI transcripts needed to be obtained in the usual way, thus the AAI was conducted in person whilst six demand questions from the AAI were

administered online via an online survey system. The online survey system was specifically designed for this pilot study, to capture participants' self-editing processes, such as pauses, deletions and insertions. This was done with the intention of gathering spontaneous information that participants could choose to include or not, in the final version of their entries. It was conceivable that participants might, given the opportunity, self edit in a way that is not possible in a spoken and recorded interview, to present themselves in a more socially acceptable way. Furthermore, participants were asked to answer the Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004) also online. Given that metacognition and reflective functioning are often used interchangeably in the literature (see Section 1.5), it was worth exploring whether assessing metacognition by means of the MCQ is comparable to assessing RF by means of the traditionally administered and rated AAI.

Significant correlations between the RF online approach and the 'gold standard' (i.e. the AAI rated with the RF scale) could help establish initial validity of the new online automated measure. Alternatively, significant associations between the metacognition questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004) and the 'gold standard' could also signify a positive development in the assessment of reflective functioning.

2.3.1 Hypotheses

- Online-based assessment scores will correlate with traditionally scored interviews.
- CRF scores of the online transcripts will correlate with traditionally scored interviews.

- Metacognition overall scores will correlate with traditionally scored interviews.
- Online generated transcripts will be comparable to full-length transcripts in terms of quality of the content, yet substantially shorter.

2.3.2 Methodology

2.3.2.1 Design

This study used a cross-sectional design. Participants were assessed for RF and metacognition. To assess RF the traditional interview-based measure was used, alongside the new online-based survey, which also included the metacognition questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004).

The main purpose of this pilot study was to find an alternative measure for RF that was both reliable and practical, making it more feasible to use RF assessments in conjunction with other measures in large-scale studies. Therefore, it would have been impractical to ask online the 20 questions that constitute the AAI (AAI; Main & Goldwyn, 1991). Fonagy and colleagues (1998) distinguish between ‘demand and permit’ questions within the AAI for the purposes of rating reflective function (p. 52). Given that demand questions must be rated for RF, it was decided to only include those in the online task and measure convergent validity between the metacognition questionnaire, the RF task and the traditional assessment method.

Furthermore, the decision to only use the demand questions was substantiated by

literature suggesting that leaving out some questions of the AAI, does not bias the overall RF score (Taubner et al., 2012). Also, it is worth noting that some researchers have already identified that transcripts other than full AAI transcripts (e.g. clinical interviews) are a valid source or alternative forms of verbal data that can be analysed for RF (Fonagy et al., 1998, Fertuck et al., 2012). Lastly, testing for correlations between the metacognition assessment and RF would help corroborate or reject the assumption that these two concepts are closely linked. If there were significant associations, it would mean that the assessment of metacognition is a good indicator of reflective functioning.

2.3.2.2 Ethical Approval

This study was reviewed and received ethical approval by the University of Edinburgh's School of Health in Social Science Ethics Panel in December 2011 (see Appendix 1).

2.3.2.3 Participants

Twenty-two participants were recruited for this pilot study. An email was sent out to students from the University of Edinburgh within the School of Health in Social Science, briefly outlining the main purposes and objectives of the study. To further encourage students to volunteer and to take part, the possibility of entering a prize draw and winning a £30 Amazon voucher was also mentioned. Participants ranged between 18 and 53 years of age and were mostly females (n=18). They all completed

the Adult Attachment Interview (AAI) administered in person, and answered online the six demand questions from the AAI, the Metacognition Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004) and a brief demographics form (age and gender). Due to various concerns that arose during the interview, such as interruptions and insufficient time designated to complete the interview, nineteen participants' data was included in the final analysis.

2.3.2.4 Measures

The Adult Attachment Interview (AAI; George, Kaplan & Main, 1985)

The AAI is a semi-structured interview that intends to evoke early attachment related situations, and encourages the interviewees to reflect on their childhood experiences and how these may have impacted their development and adult lives. This measure consists of 20 questions and several standardized probes that aim to get individuals to describe in detail their childhood relationship with their parents. The questions, probes and general structure of the interview have been designed to surprise participants' unconscious so they either elaborate upon previous statements or contradict themselves. Either way the intention of the questions is to elicit responses indicative of the persons' state of mind, particularly with regards to attachment figures. This measure is usually administered in a one hourly session, but can take up to ninety minutes in some cases. The interview's psychometric characteristics indicate good inter-rater and test-retest reliability, as well as discriminant validity (Sagi et al., 1994).

The Reflective Function Scale (Fonagy, Target, Steele & Steele, 1998)

The AAI was transcribed and scored for reflective functioning with the RF scale. Coding for reflective functioning with the RF scale implies evaluating the interview transcripts by finding those passages where participants have made explicit their reflective capacities. Examples of clear RF involve showing an awareness of the nature of mental states, making an effort to link mental states to behaviour, revising mental states and how these are affected by developmental changes, and lastly acknowledging the separateness of minds with the interviewer. Once these aspects have been assessed, the coder will assign an overall score ranging from -1 to 9. The lowest score is indicative of “negative” or absent RF whilst the highest score indicates exceptional RF. The scale has good psychometric characteristics (Fonagy et al., 1998). Taubner and colleagues (2012) thoroughly assessed the internal structure of the RF scale and confirmed its reliability. They reported inter-rater reliability of the demand questions being statistically significant at $p < .05$, with *ICC* ranging from .27 to .45. Overall scores were also confirmed to be reliable, with an *ICC* of .71, likewise statistically significant at $p < 0.5$.

The Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004)

This questionnaire consists of 30 items to assess five distinct metacognitive factors considered important in predicting psychological distress and anxiety. These five dimensions are called ‘positive beliefs about worry’, ‘cognitive confidence’, ‘cognitive self-consciousness’, ‘uncontrollability and danger’ and ‘need to control thoughts’. The

first factor ‘positive beliefs about worrying’ consists of items that suggest worrying helps both problem solving and planning, but also that it is a positive and desirable personality trait. The second factor ‘uncontrollability and danger’ is constituted by negative beliefs about worry and thus questions look at how worry must be controlled to remain safe and be able to function. Factor three or ‘cognitive confidence’ includes items about one’s lack of trust in cognitive capacities such as memory and attention. The fourth factor ‘need to control thoughts’ consists of items looking at superstition and guilt in relation to negative consequences associated to the lack of control of one’s thoughts. Lastly, factor five ‘cognitive self-consciousness’ reflected preoccupation with one’s thought processes, leading to excessive monitoring tendencies. All items of the MCQ are scored on a 4-point Likert scale. Respondents are asked to indicate ‘1 = not agree’, ‘2 = agree slightly’, ‘3 = agree moderately’ or ‘4 = agree very much’ with regards to the statements presented in the questionnaire. Consequently, overall scores range from 30 to 120. The higher the score the more the person presents monitoring tendencies and is experiencing worrying and intrusive thoughts. The MCQ shows excellent internal consistency and convergent validity for all its subscales, as well as adequate test–retest reliability (Cartwright-Hatton & Wells, 1997; Wells & Cartwright-Hatton, 2004).

2.3.2.5 Procedure

Participants were randomly allocated into one of two groups, which were later designated group A and group B. Students in group A were interviewed in person first and secondarily asked to complete the online survey. In contrast, participants that were

allocated to group B were asked to answer the online measures first, and were interviewed secondly. This counterbalancing procedure was used to control for the effect of being exposed to either the full interview or the online task first.

All the interviews were conducted on a 1:1 basis with the main researcher in private rooms at the University of Edinburgh. The participants and the researcher would communicate via email to previously agree on the date and time. Interviewees were given information sheets and consent forms to be signed, prior to beginning the assessment. The interviews were recorded to facilitate subsequent accurate transcription. Additionally, for those participants allocated to group A, the link to access the online survey was provided at the end of the interview session. Contrary to this, participants who were assigned to group B received via email the link to answer the online survey prior to interview. The survey included an information sheet and consent form prior to the assessment. Neither participants in group A nor B were expected or instructed to complete both the 'in person' and online assessments on the same day. The interviews were transcribed verbatim. The online RF assessment did not require transcription since participants directly typed the text in the survey system. Thus, these automatically generated transcripts were downloaded from the survey system as text files, and then forwarded to the same reliable RF coders that scored the longer interviews. There were two reliable raters involved in this process, who had been trained at the Anna Freud Centre in London. Each rater coded 11 AAI transcripts and 11 online derived transcripts. The data was carefully selected to make sure the coders did not get the same participant's pair of transcripts. Additionally, coders were blind to the demographic variables to minimize biases.

2.3.2.6 Data Analysis

Data was analysed with SPSS version 21 (Statistical Package for Social Sciences). Descriptive statistics were calculated for demographic and measured variables. Due to sample size, Spearman correlation was used to test the hypotheses.

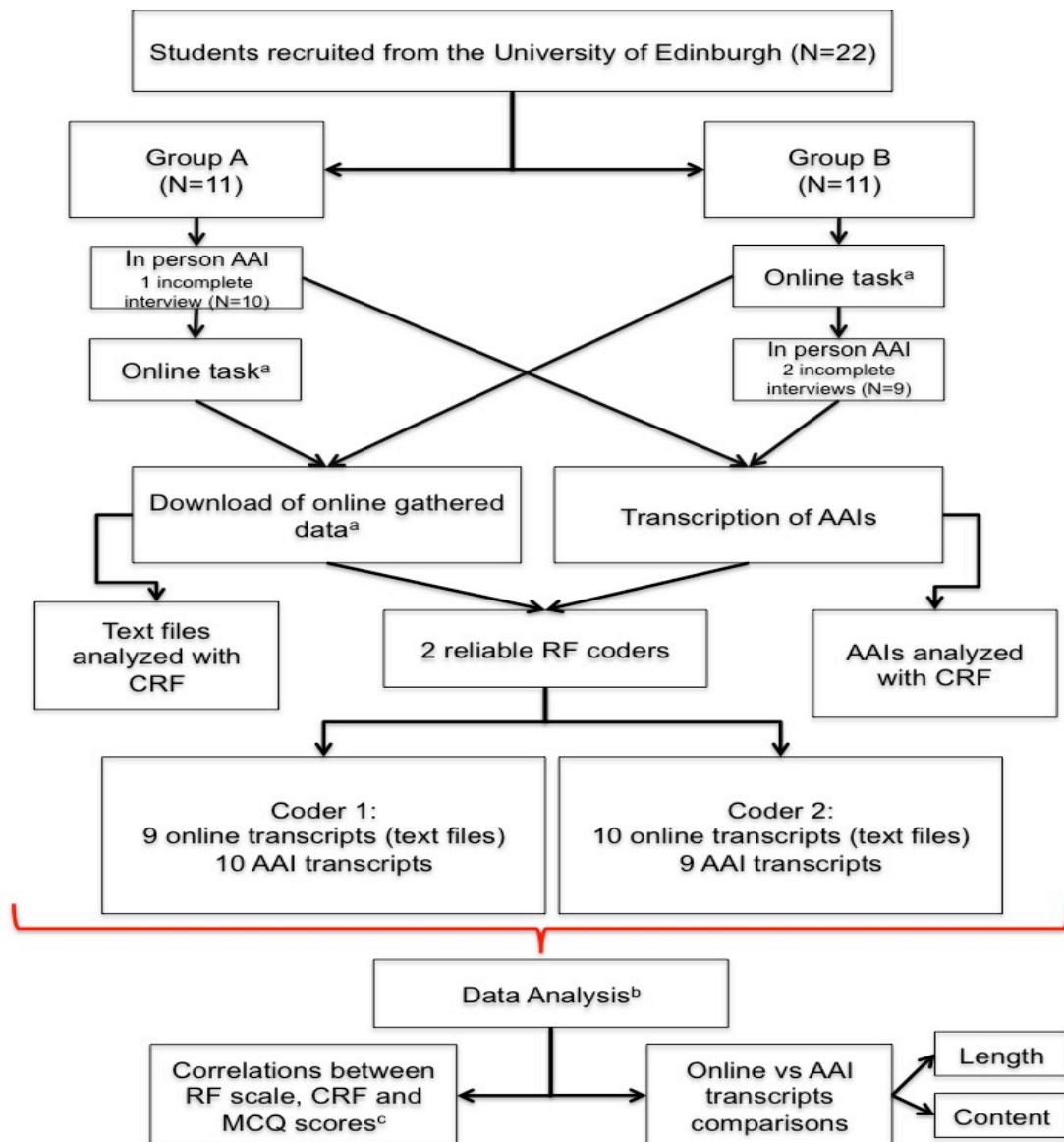


Figure 2.1 Diagrammatic representation of the pilot study's methodology

^a Demographic information, AAI-demand questions, MCQ-30

^b Three participants' data was excluded because their AAIs were incomplete due to insufficient time having been designated to complete the interview.

^c RF scale= RF scored in the AAI and online transcripts by the reliable coders / CRF= RF scored in the AAI and online transcripts by the Computerized RF method / MCQ= Scores in the Metacognitions Questionnaire (MCQ-30)

2.3.3 Results

Descriptive Statistics

Overall RF scores, derived from the AAI administered in person (RF-AAI), ranged from 1 to 7.5 whilst RF scores derived from the online task (RF-Online) ranged from 3 to 7. The CRF scores for both the AAI and Online task have not been scaled to fit the traditional -1 to 9 RF scale, but descriptive statistics of them along with details on the MCQ scores and demographics are given in Table 2.1

Fertuck and colleagues (2012) do not specify how to scale the overall RF score obtained with the CRF. However, if researchers wish to compare and interpret the scores within the bounds of Fonagy and colleagues' (1998) RF scale, scores need to be scaled. A possible way to do this within a large sample would be as follows:

- 1) Compute the CRF for all participants in the sample*
- 2) Find the largest CRF value within the sample (MaxCRF)*
- 3) $CRF_{scaled} = CRF * 9/MaxCRF$*

Within a large community sample the above formula would work because it is reasonable to assume that there will be at least one participant who will score the highest RF possible in the RF scale, which is 9. However, if the sample is smaller or has certain characteristics (e.g. clinical populations) that would make it unlikely for the highest score to be a 9, then the formula needs to be adjusted to consider the highest

possible or known number. CRF scores were not scaled in the present pilot study because the main purpose of it was not to compare or interpret RF scores within the bounds of the RF scale proposed by Fonagy and colleagues (1998), but to be able to test for significant correlations between traditionally measured RF and CRF of online attained transcripts.

AAI-RF and Online-RF measured with the traditional RF scale

It was hypothesized that online-based assessment manual scores would correlate with manually scored interviews. To test this and explore the feasibility of using an online survey to assess RF, the relationship between RF (AAI-RF) and RF Online (Online-RF) was investigated. Spearman correlation coefficient was used due to the small sample size. There was a moderate, positive correlation between the two variables [$r_s=.50$, $n=19$, $p=.02$], with higher levels of RF measured by the RF scale on the AAI being associated with higher levels of RF measured by the RF scale on the online task (see Table 2.2).

AAI-RF and online-RF as measured by the CRF

It was hypothesized that CRF scores of the online transcripts would correlate with traditionally scored interviews. To explore the possibility of using a fully automated RF measure by combining the CRF with an online-based assessment, the relationship between the ‘gold standard’ AAI-RF and the Online-RF measured with the CRF was explored. Again, Spearman correlation coefficient was chosen due to the small sample

size. There was a moderate, positive correlation between the two variables [$r_s=.49$, $n=19$, $p=.03$], with high levels of RF measured by the RF scale on the AAI being positively associated with CRF scores on the online task (see Table 2.2).

AAI-RF and the MCQ-30

It was hypothesized that metacognition scores would correlate with traditionally obtained RF scores derived from the AAI. Thus the relationship between AAI-RF and Metacognition total score was investigated. Once again, Spearman correlation coefficient was utilized but no significant correlation was found (see Table 2.2). Additional analysis went on to show that none of the five subscales pertaining to the MCQ were significantly associated to RF scores.

Transcript comparisons

It was hypothesized that online generated transcripts would be comparable to full-length transcripts in terms of quality of the content, yet substantially shorter. This assumption was supported by the data. The RF scores from manually rated full AAI transcripts correlated positively with those from also manually rated online generated transcripts [$r_s=.50$, $n=19$, $p=.02$], suggesting that both types of data gathering are reliable and that the online transcripts are an adequate alternative to the longer interview. Furthermore, the online transcripts were, as expected, significantly shorter than those obtained by interviewing participants in person. In fact the mean word count for online transcripts was 372 words versus an average of 8500 words in AAI

transcripts. Additionally, by analysing the edits captured by the online system we (the main researcher and the two coders) realized that people did a lot less self-editing than was expected and thus coders did not rate the edits, as they seemed irrelevant in content. The edits were mainly practical edits - that is people correcting grammatical errors rather than revising the meaning of the final text.

Table 2.1 Descriptive statistics of RF, CRF, MCQ and Age

	Minimum	Maximum	Mean	Std. Deviation
Age	22	53	32.4	10.42
AAI-RF*	1	7.5	5.65	1.44
ONLINE-RF*	3	7	4.92	1.22
AAI-CRF*	2.1	3.41	2.77	.39
ONLINE-CRF*	.35	2.05	1.54	.43
MCQ-POS*	6	23	9.9	4.39
MCQ-NEG*	6	23	9.9	4.11
MCQ-CC*	7	18	11.1	2.93
MCQ-NCT*	7	20	11.9	3.45
MCQ-CSC*	9	20	14.7	3.56
MCQ-TOT*	39	80	57.47	11.93

* AAI-RF= Reflective Functioning (RF) measured with the Adult Attachment Interview (AAI) / ONLINE-RF= RF measured online / AAI-CRF= RF measured with the computerized method (CRF) and the AAI / ONLINE-CRF= RF measured with the CRF and online / MCQ-POS= Metacognition Positive Beliefs About Worry / MCQ-NEG= Negative Beliefs About Worry / MCQ-CC= Cognitive Confidence / MCQ-NCT= Need to Control Thoughts / MCQ-CSC= Cognitive-Self-Consciousness / MCQ-TOT= Metacognition Total Score

Table 2.2 Correlations between RF, CRF and MCQ

	1	2	3	4	5
1 AAI-RF					
2 Online-RF	.501*				
3 Online-CRF	.493*	.626**			
4 AAI-CRF	.536*	.161	.360		
5 MCQ-30	.044	.228	.400	-.141	-.187

*. Correlation is significant at $p < 0.05$

** . Correlation is significant at $p < 0.01$

2.3.4 Discussion

This study demonstrates that assessing RF online is feasible. Furthermore the results suggest that the possibility of fully automating the assessment of RF, by combining the online approach with the CRF measure (Fertuck et al., 2012), is also attainable. The new assessment tool saves researchers from interviewing, transcribing and having to rely on reliable raters to code the AAI for RF, thus it provides an alternative instrument suitable for use in different samples and study designs (e.g. online). This has important implications as it might mean that the concept of reflective functioning could become far more accessible for researchers. Thus, to include RF in studies of a wide range of designs and not only those that involve interviews, transcripts and coders, would be possible.

The fact that RF scores from manually rated AAI transcripts correlated positively with those from also manually rated online generated transcripts suggests that both types of data gathering are reliable, and that the online transcript is an adequate alternative for the traditional time consuming method. Furthermore, it suggests the narratives are sufficiently similar in content, regardless of the method used to obtain them. It has been suggested that reflective functioning is not a stable capacity; instead it differs across a variety of situations. Indeed, Fonagy and colleagues (1998) discuss RF and its nature from a developmental perspective, suggesting that reflectiveness in people will vary depending on the situation. They make reference to the ‘dynamic skills theory’ (as cited by Fonagy et al., 1998), which implies that RF is not a characteristic of the person, but of the situation in which the person is immerse in. The fact that in-person

interviews scores correlate significantly with the online-based assessment of RF indicates that although different, the situations are sufficiently similar to elicit comparable responses in terms of quality and content. However, the transcripts did differ in terms of length. The online transcripts were, as expected, significantly shorter than those obtained by interviewing participants in person. Understandably, coders took significantly less time to code online transcripts than AAI transcripts. But in spite of these promising results, one must note that the correlation between scores, although it reaches statistical significance, it is not a strong one and that could be because people are likely to provide more detailed answers to a person who follows up with probes. One possible way to address this problem is to use an Eliza like system (Weizenbaum, 1966) to elicit longer and more detailed responses. This may then provide an even higher correlation between the RF and CRF scores. Furthermore, it was interesting to note that participants did a lot less self-editing than was expected. For those participants who did the in-person interview first, this result did not come as a surprise since we considered that by having done the interview first they had ‘warmed up’ to the questions and possibly remembered their responses, thus the answers were clear and accessible in their minds by the time they did the online task. Yet, the fact that participants who answered the six demand questions from the AAI online first, did not do a lot of self-editing either was an unexpected outcome. The AAI questions, as it has been previously mentioned in this chapter, are designed to surprise the unconscious and examine the working models that participants hold with regards to their attachment figures. The questions are by no means straightforward or easy to answer; on the contrary they are challenging and pose a difficult task to undertake (George et al., 1996). Thus, for participants to do only a small amount of self-editing

was counterintuitive. However, research has shown that online assessments are perceived as more anonymous and thus tend to make respondents feel more comfortable. Thus not having the presence of the interviewer removes social pressure to answer in detail, which reflects in the overall length and self-editing of the transcripts (Pedersen et al., 2012).

However, the fact that in spite of the amount of self-editing and overall transcript length, the quality of the content did not greatly differ between the two sets of data signifies an important improvement to the assessment of RF. Using shorter and automatically generated transcripts leads to a faster, less expensive and much more practical measure of RF, even when being scored with the traditional RF scale. Nonetheless, it is important to note that generally speaking full AAI transcripts got higher scores than the shorter online generated transcripts. This is consistent with other researchers' findings (Taubner et al., 2012), and it suggests that coders tend to use the whole of the information provided by full-length transcripts, and not just what is relevant to the demand questions. Thus, it is possible that the RF level of participants as shown in the short online-based transcripts was somewhat undervalued by the coders.

To be able to consider a fully automated assessment we checked for correlations between the RF on the AAI and the CRF on the online transcripts. The statistically significant association between these sets of data suggests that assessing RF by means of a fully automated measure is reliable and comparable to the current gold standard. Furthermore, it confirms the power of the High CRF dictionary even when used with

short narratives (Fertuck et al., 2012). This finding signifies a huge advantage for researchers interested in using the concept of RF in studies with large samples. A combination of narratives obtained online with computerized scoring of RF results in an automated method of assessment, far less elaborate and time consuming when compared to the current manually scored system.

However, although the CRF is a very important advance on the assessment of RF, it still has limitations. The fact that scores are not scaled to match the RF scale (Fonagy et al., 1998) makes the interpretability of the CRF scores a bit less clear. Most of the literature on RF uses the RF scale as a reference point to describe high, moderate and low levels of reflectiveness, or to cluster participants according to their RF level and make relevant comparisons of other measured variables. With the CRF it is hard to reach the same conclusions, because one can only refer to the scores within the tested population, so the highest CRF of a given sample would not necessarily be representative of a highly reflective individual as measured by the RF scale. Clustering participants to make group comparisons would not be as convenient.

Contrary to what was expected, results with regards to metacognition and reflective functioning suggest that RF and metacognition as measured by the MCQ-30 are different concepts. Metacognition encompasses the aspect of mentalization that refers to cognitive monitoring, regulation, inhibition and adaptation (Fonagy et al., 1998), whilst mentalization or RF is a broader and more complete concept that combines both cognitive and emotional aspects (Fonagy & Target, 2002). Moreover, metacognition as measured by the MCQ-30 does not only look at whether a person reflects upon their

thinking. This questionnaire assesses the nature of the thoughts in relation to cognitive processes associated to worry proneness, anxiety and predisposition to obsessive-compulsive symptoms. Thus it is an extremely helpful measure to be used with clinical populations, as it discriminates between individuals who are afflicted by intrusive thoughts and those who are not. It focuses on intrapersonal experiences allusive of worrying, superstition and cognitive monitoring (Cartwright-Hatton & Wells, 1997). On the other hand, reflective functioning as measured by the RF scale on the AAI involves both intrapersonal and interpersonal experiences associated to attachment figures. It looks at the self-reflecting capacities, along with those needed to differentiate internal from external experiences of the self and other. Reflective functioning goes beyond self-awareness of one's thoughts and self-monitoring tendencies as it includes an emotional aspect that proves essential for self-organization by allowing individuals to understand both the self and other's affective experiences in terms of mental states (Fonagy et al., 1998). In summary, mentalization and metacognition differ in that the operationalization of these concepts does not emphasize the same capacities. Metacognition assessment by the MCQ-30 does not look at the interpersonal relational and affective experiences, but focuses mainly in the rational tendencies that shape somebody's cognitive model.

This pilot study has four main limitations. First, criterion validity for the CRF is preliminary due to limitations around the development of the dictionaries, thus results must be interpreted with caution. Second, in hindsight, it would have been better if participants had been given explicit instructions to complete the tasks with a specific time gap in between. It is possible that learning about the AAI questions interferes

with spontaneous expression of RF, which could have biased the results. Third, the study would have benefited from both coders rating all transcripts, but the lengthy process of scoring for RF prevented this from being achievable. Lastly, the sample size is too small to be considered representative of a community sample.

2.4 Conclusions

To conclude, the pilot study produced promising results indicative of the feasibility of using a fully automated method to assess reflective functioning. This poses significant advantages by drastically reducing the time and resources needed to assess RF. Additionally, by relying on the High CRF dictionary instead of human rating we eliminate the subjective individual bias introduced by each coder. As mentioned by Fertuck and colleagues (2012), the approach used to develop the dictionary and identify the high RF word markers is an empirically driven one, thus verifiable, consistent and objective.

2.5 Implications for this thesis

A fully automated assessment of RF meant that the construct could be included as a predictor variable in a large-scale online study. Having identified that the Metacognition Questionnaire measures a different construct from RF allowed for an informed decision to be made, with regards to the inclusion of this scale and its interpretation within the context of the forthcoming online-based study.

Section 3

Main study design and methodology

Section 3:

Methodology

Introduction

The main purpose of this PhD was to investigate risk of developing bipolar disorder within the framework of developmental and cognitive aspects, in particular attachment style, reflective functioning, emotion regulation and metacognition. In this section the methodology followed to achieve this study's aim will be thoroughly described. The comprehensive presentation of the procedure that was followed will include a clear description of the research design, data collection phase, measures used and data analysis scheme.

3.1 Hypotheses

- Insecure attachment will directly predict both dysfunctional emotion regulation and reflective functioning.
- Insecure attachment will indirectly predict bipolar proneness through dysfunctional emotion regulation.
- Reflective functioning will mediate the relationship between insecure attachment and dysfunctional emotion regulation.
- Reflective functioning will indirectly predict proneness to bipolar disorder through dysfunctional emotion regulation.
- Dysfunctional emotion regulation will directly predict proneness to bipolar disorder, depressive symptoms and negative metacognitions.
- Depressive symptoms and negative metacognitions will directly predict

proneness to bipolar disorder.

3.2 Method

3.2.1 Design overview

The study used a cross-sectional design to assess participants at one point in time and attempt to better understand the characteristics of individuals who are prone to developing bipolar disorder. A large and diverse sample was needed; hence recruitment of participants was done online via a survey system especially designed for this study. Designing, developing, testing and disseminating the survey system took about 4 months in total, whilst recruitment went on for about 8 months. The survey system can be accessed at www.psychology-test.co.uk and it continues to prove, to date, as a valuable and practical tool to gather data. From the date it was put up online till now it has had around 8000 entries, out of which about 45% are complete and have no missing values. Not all entries were used for this project but just those that were collected up until April 17th 2013. Generally speaking the survey system generated a very good response rate, attributable to the fact that it was designed to provide feedback to those who chose to take part in the study. Giving feedback was thought as a strategy to motivate participants and avoid incomplete or repeat entries. The survey system integrated the online reflective functioning measure that was developed prior to this study and described in Section 2 of this thesis. Lastly, participants were also given the opportunity to enter a prize draw to win an iPad, again as an effort to stimulate and increase response rate.

The research project aimed to be both descriptive and explanatory, being the principal objective to shed some light on the factors, and relationships between them, that may contribute to an increased risk of developing bipolar disorder. Therefore, choice of a cross-sectional design was justified since it was the differences across individuals, rather than changes across time, which constituted the main interest of this research. Additionally, to be able to better understand the characteristics associated with an increased risk of developing bipolar disorder, a statistical technique such as Structural Equation Model (SEM) was the most appropriate because it allows researchers to effectively explore associations amongst variables and their inherent complexities, in a non-linear manner. To use a complex method of data analysis such as SEM, with high levels of effectiveness and reliability, it was crucial to collect a large and diverse amount of data, which made the chosen types of design and recruitment the most suitable and feasible.

However, like any other research design, cross-sectional designs have limitations that mainly relate to the conclusions that can be drawn from findings and results. Associations and effects demonstrated from this dataset must be interpreted properly, and although predictive and probable causal interpretations are both accessible and appropriate, thanks to the use of Structural Equation Modelling, strong deterministic causal inferences should be avoided.

3.2.2 Ethical Approval

This study was independently reviewed and received ethical approval from the

Clinical Psychology Ethics Research Panel at University of Edinburgh (see Appendix 2).

3.2.3 Recruitment

From the start of this PhD the intention was to gather a sample as varied and robust as possible to allow for testing of the hypotheses by means of Structural Equation Modelling (SEM). Within the recruited group it was expected to find subsets of individuals that would be representative of subclinical and community samples. Also, to lessen the biases with regards to demographic characteristics, it was desirable to gain access to a variety of suitable settings to recruit from; as opposed to relying only on University students which is a commonly and well know pool to recruit participants from. Due to these particular aims, the decision to recruit and assess online was made, as it broadens possibilities.

3.2.3.1 Sample size and power calculations

A good research design must have adequate statistical power to detect an anticipated effect size of statistical significance (Banerjee et al., 2009). Thus the sample size was calculated based on anticipated effect size, desired statistical power and probability level. To estimate the optimal number of participants for this design an *a priori* sample size calculator, available online (<http://www.danielsoper.com>), was used. Given the complexity inherent to bipolar disorder, it is reasonable to assume that a wide range of variables, beyond the ones measured in this study, play a role in its

development. Thus, only a small effect was anticipated so the effect size was set to 0.1, whilst the desired statistical power was set to the recommended level of 80%. Anticipating a small effect and setting the power level to at least .80 helps minimize the risk of incurring in a type II error. Lastly, the probability level or in other words statistical significance was set to the recommended 0.05, to maximize the confidence levels in the findings and decrease the possibility of incurring in a type I error (Banerjee et al., 2009). Next, the sample calculation was done and results indicated that a minimum of 2395 participants were necessary to detect the anticipated effect, attain the desired statistical power and maximize the confidence levels.

3.2.3.2 Online recruitment

A robust community sample of 2325 participants was recruited thanks to the online recruitment approach that was followed. The difference between the optimal minimum sample calculated a priori and the actual sample obtained, was not substantial, thus it did not alter the power of the study. Estimating the sample size a priori and respecting the power related statistical parameters is particularly important to empirical research, because testing a hypothesis within an insufficiently powered design undermines the possibility of asserting reliable results, thus diminishes in itself the overall contribution of the study (Banerjee et al., 2009).

In addition to facilitating the access to a vast number of participants, online recruitment allows for demographic related biases to be lessened. A decrease in the chances of having a skewed sample, arises from the possibility of recruiting a large

sample of participants from around the world and thus from a variety of marital, educational and cultural backgrounds amongst other population characteristics. In a recent and controversial article by Henrich, Heine and Norenzayanon (2010), these demographic biases, often found in psychological research were highlighted. The authors' investigation of social science research suggested that too many studies were carried out on Western Educated Industrialized Rich and Democratic populations (WEIRD), yet results were treated as generalizable. One of the main aspects highlighted by this review of research is that white, young college students too often, largely constitute the samples used in psychology and other social science research. In a comparative analysis by Gosling and colleagues (2004), they found that out of all the studies published in the *Journal of Personality and Social Psychology* in 2002, 85% used university student samples, mainly constituted by young, white females. The overrepresentation of participants with such demographic characteristics signifies a serious bias in psychology research, and needs to be addressed. The use of Internet surveys to carry out research is a plausible solution. According to Henrich et al. (2010), even though the number of participants that do not have the WEIRD set of characteristics within internet samples is still small, online recruitment allows for a lot of participants to take part in research, thus the relatively small number of non white educated participants still account for representative samples of other type of populations. In conclusion, internet based designs have the potential to allow researchers to recruit significantly larger and more diverse samples than those they would get by means of conventional methods. However, use of the Internet in itself will not guarantee large amounts of good quality data to be collected, nor will it account for time and cost effective designs

(Fricker & Schonlau, 2002). It is up to the researcher to invest time and effort into putting together the study in a suitable way that is likely to attract participants, and to promote the study in relevant websites, blogs and other web based spaces.

Although the benefits of online research are apparent, it is often the quality of the obtained data that is questioned and quoted as a limitation of internet-based designs (Gosling et al., 2004). Recruiting participants online and whether or not the data obtained is comparable to that gathered with more traditional methods constitutes an interesting question. Online studies are sometimes perceived as less reliable than those following ordinary methods because of the lack of control over the participants and their responses. It is often assumed that online designs have to deal with response duplication and/or with participants answering untruthfully. However, this is not entirely true. For some Internet studies this can be the case but certainly not for all, not to mention that there are a number of ways to overcome these difficulties. How flawed the online study is, largely depends on the effort put by the researcher into minimizing the known limitations.

Gosling and colleagues (2004) reviewed some common prejudices usually considered limitations of internet methods, and found that for most of these there is no actual evidence that supports and justifies the rejection of online methodologies. According to their analysis, Internet recruited samples are no less diverse in terms of demographics, nor are they biased in terms of over-representing a particularly shy or alienated sector of society. One could argue that this is not as surprising after acknowledging that most psychological research relies on biased samples largely

constituted of western, educated female participants. In the face of this fact, it would be hard to recruit samples that are even less diverse. Moreover, the authors compared the quality of data gathered online with that obtained by traditional methodologies and found consistency in the reported results. The latter suggests that Internet data is not particularly more prone to be affected by false responses or multiple entries by the same participant. Gosling et al. (2004) explained this cross-methods consistency by emphasizing the fact that because online designs allow for participants to obtain immediate feedback, it is less likely for responders to choose to lie about their responses. However, giving feedback is up to the researcher and most certainly not all Internet designs use this method to increase motivation and response rate and decrease other limitations. In fact, most online studies offer the chance to win prizes as an incentive for participation. Although this technique is effective and increases response rates, research on the matter shows that more immediate gratification serves as a better reward, that reflects on an even higher response rate (Tuten et al., 2004).

In summary, online recruitment and assessment facilitate a higher response rate, at a lower cost both financially and in terms of invested time, without compromising the quality of the data gathered. Although, Internet studies have limitations, these are by no means insurmountable. Indeed this study has taken multiple measures to overcome these limitations (see below). It is important to note that traditional methods have a number of limitations of their own, such as human error during assessment and data entering; additionally in person assessment very often leads to really small skewed samples that lack sufficient statistical power, mainly due to the large amount of effort and time needed to recruit and assess even a small number of

participants. Having said this, it is also true that not all kinds of populations can be assessed online, thus if the researcher has an interest in the kind of sample unlikely to have access to the internet, or particular methodologies that rely on experimental designs or observations, then traditional methods are the only way forward.

3.2.3.3 The Survey System Design and Dissemination

As previously mentioned the survey system utilized to gather data was specifically designed for this study. The main reason for doing so, as opposed to using an available surveying system such as ‘surveymonkey’, was to enable participants to get immediate feedback after entry completion. Therefore the system was designed with features that allowed immediate personal feedback after entry completion. As it has been established above, online recruitment can facilitate a large sample size, but taking steps to effectively motivate potential participants would significantly increase the likelihood of a high response rate.

Development of the survey system and webpages associated with it began with the selection and registration of a suitable domain name. A simple and easy to remember domain was chosen www.psychology-test.co.uk. Following, the design and implementation of the simple website, with which participants would interact to take part in the study, took place. Because a template was needed, initial efforts were put into finding a suitable template that was both free and open source. Once a suitable template had been selected, it was edited in Hyper Text Markup Language (HTML). Then, an experienced outsourced developer was given the specifications of the

project to facilitate the implementation of the survey system and its corresponding admin system. Given the complexities associated with the specific characteristics of the requested system, the developer took about six months to complete the task. The development of this online survey system was funded by the primary researcher. Alongside development of the system, the latter was being thoroughly tested by the main researcher, to ensure it worked correctly and bugs could be fixed when present. Also, security and data protection issues were tackled by relying only on up to date software to build the system. To prevent any security issues from arising later on, this software is periodically checked to ensure it is always up to date. Additionally, to increase security of the data the system design included username and password features to access the admin portal. After completion of the development phase, the password was changed, guaranteeing that only the main researcher had access to the admin system. Finally, once the survey was ready to be put online, a web-hosting service available at a low annual rate was used to make the website accessible (www.justhostme.co.uk).

The landing webpage's design (see Appendix 3) was very important since it would highly influence the potential participants' decision to take part in the study. Therefore, it was key to write up the text for this initial page in a way that was both compelling and concise, only including the essential and relevant information to ensure informed consent whilst encouraging participation. The study was described in simple language, avoiding psychology jargon, and presented in a clear format, aiming to encourage people to learn more about themselves given that they would get feedback in the end. Also, in this landing page, reference was made to

participation being an opportunity to help researchers learn more about bipolar disorder, as well as it giving them the chance to enter a prize draw to win an iPad.

If participants had made the decision to take part they would click on a link that redirected them to the survey. The first page in the survey was an information sheet to address important issues in relation to what participation consisted of, what was expected from them, anonymity concerns, aims of the study and some relevant links to help-lines and other similar websites that could provide assistance in the event of distress arising from answering the questions that constituted the study (see Appendix 4). Following this information sheet was a consent form asking participants to check a box to indicate agreement with taking part amongst other statements (see Appendix 5). Once consent was given, participants were asked to fill in some demographics followed by the questionnaires selected to assess bipolar proneness, attachment style, emotion regulation capacities, metacognition, depression and reflective functioning. Participants were encouraged to answer all the questionnaires in one go, plus they were asked to provide an answer to all the questions presented in each page, or else redirection to the upcoming section was denied. This means that even if participants did not make it to the end of the survey, the information entered would be as complete as possible and thus potentially useful. At the end of the survey participants were asked to leave a valid email address to be contacted at, in case they won the prize draw and if they granted consent to be contacted about other research studies. They were also asked to choose whether or not to see their results and feedback (see Appendix 6) and whether or not they would like to take part in the prize draw. Finally everyone would get redirected to the end

webpage containing information about help-lines and links to other online psychology research. Also, Facebook and Twitter buttons were added to this end page, to encourage participants to share their results and/or the study link with friends and family in order to take advantage of social networks to spread the study.

Other essential actions that were taken to effectively design and later propagate the study included the use of Google ad-words and search engine optimization to increase the likelihood of the study being found on Google when words such as ‘psychology’, ‘test’, ‘personality’, ‘free’ and ‘relationships’ were typed into the search box. Also, relevant websites and blogs (see Appendix 7) were contacted to request their help with dissemination of the study, either by means of mentioning it in their social media profiles or by adding a link to the survey in their webpages. Some of the websites agreed to do it for nothing in return whilst others, particularly blogs, requested a guest blog post about the research topic in question, or asked for a link to their own websites to be added to the end webpage of this study (see Appendix 8).

In summary, the design and dissemination strategy included:

- Offer a benefit to participants: Feedback written in simple language that everyone could understand, alongside graphical representations of the results, the possibility to enter a prize draw to win an iPad and the chance to contribute to science by helping researchers learn more about bipolar disorder.
- Make the Website look professional: Create a simple and elegant design

including one short and explanatory entrance page, to inform about the benefits of taking part and which linked to the survey prominently; and one end page which contained a list of help-lines, relevant information, social media buttons and links to other sites which had linked to my study and may be of interest to the participants.

- Make the Website easy to find: Use basic search engine optimization and research five relevant keywords, likely to be typed by people looking for the features the site offers, using Google's Keyword Tool. For this study, the chosen words were 'psychology', 'test', 'free', 'relationship' and 'personality'. The identified key words were used in the page heading, sub-heading, the body text and links. The domain 'psychology-test.co.uk' was chosen because it is clear, easy to remember and contains key words. It is crucial to take necessary actions to actively attempt to distinguish one's survey from the overabundance of surveys that exist on the Internet.
- Use of social networks: Making a compelling website and set of results made it more likely for participants to want to tell their friends and family, which would translate in an increased response rate. Facebook and Twitter buttons were added to both the landing and end pages to facilitate sharing. Also, research of relevant Twitter and Facebook pages (e.g. 'Mind' on Twitter and 'Bipolar Chick' on Facebook) was carried out to identify suitable spaces to approach and ask for help with spreading the study.
- Use of free Google ad-words: Google frequently has a promotion to give away £50 of free advertising. To promote the benefits of the website, adverts using combinations of the keywords, identified as part of the search engine

optimization process, were written up in simple text. Several adverts were tested and the best ones were selected on the basis of higher click through ratio. This strategy proved beneficial and brought about approximately 5 to 10 participants per day to the website.

- Get relevant sites to link to my site: Research of relevant websites was carried out, to identify where it would be most helpful to post a link to the study or request for this to happen. Once websites were identified, I would contact them to ask for their help but I would also offer a benefit in return, like for example link to their site from mine and/or offer to write a guest blog post. All websites that were linked from my site were added to the bottom of the end page, to avoid distracting participants from answering my survey first.

3.2.4 Materials

3.2.4.1 The Hypomanic Personality Scale (HPS-20; Meads & Bentall, 2008)

This is a 20-item short version of the original 48-items questionnaire constructed to identify people with hypomanic personalities, i.e. individuals who are prone to hypomanic episodes and therefore at increased risk of developing bipolar disorder. The 48 questions that constitute the original scale are related to stable personality characteristics and recurrent experiences, but not to current states. The instructions for this scale state that participants must answer true or false, with scores of 1 and 0 (zero) being assigned respectively. Then a final total score is derived, being 48 and zero the maximum and minimum possible scores respectively. The higher the

score the more likely the person is to be prone to developing bipolar disorder. The scale has been widely used and it demonstrates good internal consistency with an alpha of 0.87, and suitable test–retest reliability with an alpha coefficient of 0.81 (HPS; Eckblad & Chapman, 1986). However, due to the limited research addressing the dimensionality of the scale as well as its lengthiness, Meads and Bentall (2008) conducted a Rasch analysis to, a) explore the underlying factors of the scale and b) attempt to reduce its number of items. Both misfitting and redundant items were deleted, resulting in a unidimensional reduced form of the HPS, constituted by only 20 items assessing latent hypomanic traits. As a result of the Rasch analysis, researchers concluded that the short version proved to be one-dimensional, therefore individual item scores can be added up to obtain an overall score ranging from 0 to 20. Also, the kind of analysis conducted allowed for relative severity of the items to be rated and in turn provides information on what items capture more of the hypomanic trait. Lastly, the shortened version demonstrated psychometric characteristics, showing good internal consistency with an alpha of 0.80 accounting for acceptable item inter-relatedness. In the sample of the present study (N=2325) the HPS showed good internal consistency with a Cronbach's alpha of 0.78.

3.2.4.2 The Internal State Scale (ISS; Bauer et al., 1991; Glick et al., 2003)

The ISS is a mood-state self-report commonly used in studies of development and outcome of bipolar disorder. The scale is unique in that it independently and simultaneously measures manic and depressive symptoms severity, whilst it

recognizes mixed states and depressive symptoms during manic and hypomanic episodes. There are 16 items to be completed with reference to the last 24 hours, and four empirically derived subscales: activation index (AI), well being (WB), depression index (DI) and perceived conflict (PC). Unlike most mood state questionnaires, the ISS was designed for its items to tap into self-perception in addition to behavioural patterns, such as sleeping or eating. Therefore, the ISS measures heightened sense of activation, like for example rapidity of thoughts, rather than just euphoric state. Authors who developed the scale emphasized that manic and hypomanic episodes are characterized by a heightened sense of activation, irrespective of whether they are euphoric or dysphoric (Bauer et al., 1991). The AI and WB subscales can be combined to discriminate mood state in bipolar patients, whilst the AI, DI and PC subscales can be used to assess symptom severity linked to mania, depression and overall psychopathology. Originally the ISS was scored in a 100 mm visual analogue-scale (VAS) with anchor points for both severity and frequency located at the extremes of 0 and 100. However, due to the labour intensiveness of scoring the VAS, Glick and colleagues (2003) validated the ISS to be scored on a Likert scale, making it then available and suitable for a wide range of research designs, including those with larger samples like the present study. The psychometric properties of this modified version are very good. Analysis of means, inter-rater reliability and discriminating ability of the scale indicated no significant decrease in good psychometric properties when changing the ISS rating system from 100mm visual analogue-scale to a Likert format (equivalent to 0-10, 11-20, ..91-100). In terms of reliability, all the subscales are reported to have very good to excellent internal consistency, with Cronbach's alpha

coefficients ranging from 0.81 to 0.92. In the sample of the present study (N=2325) the ISS subscales showed good internal consistency with Cronbach's alpha coefficients ranging from 0.80 to 0.82.

3.2.4.3 The Relationship Scale Questionnaire (RSQ; Griffin & Bartholomew, 1994b)

This questionnaire is used to assess attachment style in adults. The items that constitute this scale refer to both positive and negative views of the self (self-model) and other (other-model), and are worded within the context of close relationships. A combination of the self and other models leads to a four-group model of attachment patterns: 'secure', 'fearful', 'preoccupied' and 'dismissive'. These four prototypic attachment styles come about as a result of combining the degree, within a continuous scale, of positive and negative views that individuals hold with respect to the self and others. These positive and negative levels of self and other perception, refer to the extent to which individuals consider themselves worthy of love and support, and think of others as trustworthy and supportive. Also, the positive and negative measurements of these self and other representations reflect the level of dependency (anxiety) and avoidance that a person feels comfortable with, within the context of a close relationship. For instance, secure attachment arises from the combination of high degree of positive self-perception and positive image of others, allowing the person to feel comfortable with intimacy without being neither dependant nor avoidant; On the other end of the spectrum, fearful attachment style results from combining poor

self-image with negative views of the other, resulting in an increased level of both dependency and avoidance; Preoccupied attachment style arises when poor self-image is combined with positive views of the other, resulting in low avoidance but high dependency; Lastly, dismissive attachment results from having a positive image of the self whilst having a negative perception of others, which translates into a high degree of avoidance of relationships, whilst dependency on others is low. Thus, the relationship scale questionnaire can be described as an indirect measure of four attachment prototypes, and two underlying dimensions (positive/negative self and other model). It is comprised of 30 items drawn from three other attachment measures (see Griffin & Bartholomew, 1994b), which are rated on a 5-point Likert scale ranging between '1 = not at all like me' and '5 = very much like me', allowing for participants to indicate the degree to which a particular item accurately represents the way they are in the context of close relationships. Total scores per attachment prototype are determined by calculating the mean of each pattern. Only 17 out of the 30 items that make up this scale are taken into account when computing the subscales' scores. One of those 17 items is used twice, in the computation of two separate dimensions' scores. The item 'I am comfortable without close emotional relationships' is used to calculate the Preoccupied subscale's score but also the Dismissing subscale's score. In the first case scores for this item are reversed, whilst in the second case they are used in their original form. In total, four items contribute to the score of 'preoccupied' and 'fearful' whilst five items make up the 'secure' and 'dismissing' types. According to the authors the internal consistency for the subscales ranges between alpha coefficients of 0.41 and 0.71. Internal consistency coefficients can be low for some

of the subscales of the RSQ because of the two independent dimensions (self-model and other-model) that are being taken into account to obtain the scores. Despite this, the scale is unique in that it allows researchers to explore attachment from three different perspectives: continuously, categorically or prototypically. Additionally, according to the authors the four distinguishable attachment patterns that are assessed by the RSQ show convergent validity when compared to other validated and proved reliable attachment measures. However, in the sample of the present study (N=2325) the RSQ subscales showed moderate to low internal consistency (see Section 4 for a comprehensive explanation). Therefore factor analysis was used to identify the structure of the scale in this particular sample. Three dimensions with an acceptable to good reliability coefficient emerged: autonomous insecure attachment ($\alpha=0.77$), anxious insecure attachment ($\alpha=0.74$) and avoidant insecure attachment ($\alpha=0.62$).

3.2.4.4 The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996)

The BDI-II is a widely known and used self-report for quantifying levels of depression. Its precursors, BDI-I and BDI-IA are equally reliable and clinically relevant measures of depression. However, symptom content in these two previous versions of the inventory was considered incomplete, when compared to the criteria for depression included in the DSM III and IV. Therefore, the BDI-II was designed to measure the severity of self-reported depression as outlined by the DSM-IV. It is a much more comprehensive measure, as it includes items in relation to worthlessness, energy loss and concentration difficulties, among others. The

BDI-II consists of 21 items scored using a four-point scale, which ranges from 0 (symptom not present) to 3 (symptom very intense). Instructions for completion of the assessment indicate that items must be answered with reference to how the person has been feeling in the past two weeks. Total scores can range from 0 to 63, with higher overall scores being indicative of more severe depressive symptoms. The cut-off scores to interpret depression severity are: 0 to 13 minimal depression, 14 to 19 mild depression, 20 to 28 moderate depression, and 29 to 63 severe depression. This latest version of the BDI presents adequate reliability and validity for clinical purposes, with an excellent internal consistency (Cronbach's alpha coefficient of 0.91) reported by its authors. Later in 2008, Holländare and colleagues validated the BDI-II to be used online. According to their findings the inventory can be safely used online as it holds its good psychometric properties, including its excellent internal consistency, with a reported Cronbach's alpha coefficient of 0.95 (Holländare et al., 2008). In the sample of the present study (N=2325) the BDI-II showed excellent internal consistency with a Cronbach's alpha of 0.95.

3.2.4.5 The Metacognitions Questionnaire (MCQ-30; Wells & Cartwright-Hatton, 2004)

The MCQ (Cartwright-Hatton, 1997), was developed to measure beliefs about worry and meta-cognitive monitoring tendencies that are related to pathological worry, trait anxiety and obsessional symptoms, which are important when trying to better understand psychopathological processes. The MCQ-30 is the short version

of the MCQ (Cartwright-Hatton & Wells, 1997) and also measures individual differences in five distinct dimensions of metacognition that tap into topics about worry, anxiety and intrusive thoughts. The measure has a five-factor structure and it consists of 30 questions which ratings are combined to make up a total score, as well as the individual scores corresponding to each subscale or factor (six items per subscale). The higher the score, total or per subscale, the more problematic the metacognitive patterns are and the more likely the person is to experience pathological worrying, anxiety and intrusive thoughts. The questionnaire's subscales are 'positive beliefs about worry (PB)', 'negative beliefs about the uncontrollability of thoughts and corresponding danger (NCT)', 'cognitive confidence (CC)', 'negative beliefs about thoughts in general – including beliefs about needing to control thoughts due to themes of superstition, punishment and responsibility (NB)' and 'cognitive self-consciousness or self monitoring tendencies (CSC)'. Items are rated on a 4-point Likert scale, based on the level of agreement reported, with a rating of 1 representing 'do not agree', whilst the opposite rating of 4 represents 'agree very much'. According to its authors this scale was reported to have good psychometric properties based on various reliability and validity indices. Positive correlations between the MCQ subscales' scores and measured related constructs provide evidence of the convergent validity of the scale. Scores on the PB, NCT and CC subscales positively correlate to scores of worry proneness, obsessional symptoms and trait anxiety. Lastly, good to excellent internal consistency for the five subscales is reported, with Cronbach's alpha coefficients ranging from 0.72 to 0.93. In the sample of the present study (N=2325) the MCQ-30 showed excellent internal consistency as a whole with a

Cronbach's alpha of 0.93. Meanwhile the subscales also showed very good to excellent internal consistency with the 'positive beliefs about worry', 'negative beliefs about worry' and 'cognitive confidence' subscales having an alpha coefficient of 0.90, whilst the 'need to control thoughts' and the 'cognitive self-consciousness' subscales had alpha coefficients of 0.81 and 0.83 respectively.

3.2.4.6 The Regulation of Emotions Questionnaire (REQ; Phillips & Power, 2007)

The Regulation of Emotions Questionnaire (REQ) is a self-report instrument designed to assess how frequently internal and external functional or dysfunctional emotion regulation strategies are used. Results of assessing emotion regulation with this questionnaire indicate which type of strategy the respondent uses more often. Items about functional and dysfunctional strategies are worded with reference to both intrapersonal (internal) and interpersonal or environmental (external) resources, and to both cognitive and behavioural approaches to regulate emotion. Examples of the items for each of the subscales are: 'I review (re-think) my thoughts or beliefs' (internal-functional), 'I keep the feeling locked up inside' (internal-dysfunctional), 'I do something energetic' (external-functional) and 'I try to make others feel bad' (external-dysfunctional). Functional strategies, irrespective of whether they are internal or external, involve tolerance and processing of the emotion that leads to behaviours likely to promote wellbeing and facilitate greater understanding of the elicitors of such emotion. In contrast, internal and external dysfunctional strategies aim to reject or block the emotion, preventing the development of tolerance, which often leads to an amplification of

the emotional distress. Adding up the ratings given to individual items provides the score for the four subscales. There are 19 items in the questionnaire, 5 in the internal functional and dysfunctional subscales and the external dysfunctional one, whilst the external functional has 4 items. All items are rated on a 5-point scale going from “1 = never” to “5 = always”. The scale demonstrates good psychometric properties; strong evidence supports construct and convergent validity by corroborating expected correlations of the different subscales’ scores with measures of quality of life, emotional and behavioural problems and psychosomatic health issues. Cronbach’s alpha coefficients ranging from 0.66 to 0.76 suggest acceptable to good reliability of the subscales. In the sample of the present study (N=2325) the four REQ subscales showed acceptable to good internal consistency with reliability coefficients ranging from .63 to .80.

3.2.4.7 The Reflective Functioning (RF) Automated Measure

Reflective functioning refers to the capacity to understand behaviour of the self and others, by taking into consideration the underlying intentional mental states that link to it. It has been accepted as a crucial aspect of a range of developmental outcomes including attachment style (Fonagy et al., 1997). It is commonly assessed through interviews such as the Adult Attachment Interview (AAI; Main & Goldwyn, 1991). Interviews are recorded, transcribed and ultimately coded for RF by a trained and reliable coder using the Reflective Functioning Manual (Fonagy et al., 1998). The use of this scale allows for an overall RF score to be obtained, which ranges from -1 to 9. This method, although valid, was not used to assess RF

in this sample given the aim to recruit a large dataset. Thus, the fully automated way of assessing RF described in Section 2 of this thesis was used. RF was assessed online by means of the six demand questions of the AAI and scored by means of the CRF measure (Fertuck et al., 2012). The online survey system specially designed for the pilot study (see section 2 of this thesis) that logs the deletions, insertions and pauses made by participants, was not used in this sample since these self-editing details proved non-influential after analysing the pilot study data.

3.2.5 Procedure

Participants were recruited over the Internet through the use of search engines, relevant blogs and websites such as those aimed to support psychology research, and social networks like Facebook and Twitter. The survey was put online under the domain www.psychology-test.co.uk. The domain name was strategically chosen to make it easy for potential participants to find. Equally the landing web page's text was carefully written and further optimized following basic search engine optimization techniques, to increase the likelihood of being found through online search. Prospective participants, after landing on the front web page, would choose to complete the survey or not. Those who took part did so voluntarily, at their own time and pace. Prior to completing the questionnaires, participants were instructed to read an information sheet in which they were reassured of the anonymity of the data, amongst other important aspects relevant to their participation in the study. Subsequently they were briefed to complete a consent

form and some demographic details. Lastly participants were redirected to the first of seven tasks (questionnaires) that constituted the survey. Periodically throughout the course of about 8 months, stored data was downloaded from the survey's admin system, which was secured with a username and password only known by the main researcher. Afterwards, the downloaded data was securely stored in an also password protected computer, only accessible to the lead researcher of this study (see Figure 3.1 for a graphical overview). Two additional resources were used to keep back-ups of the data, a memory stick and a password protected online backup service.

3.2.6 Data analysis

Data analysis was done using two statistical packages: SPSS version 21 (Statistical Package for Social Sciences) and Mplus version 6. The process can be summarized in 6 steps:

- Descriptive statistics were obtained for the whole sample. Means and frequencies were calculated for demographic variables as well as for all measured variables.
- Questionnaires' internal consistency was tested by calculating Cronbach's alpha coefficients for each measure and its dimensions.
- Distribution of the data was analysed graphically, by looking at the histograms.
- Group mean comparisons were carried out with regards to all measured variables. ANOVA and independent sample t-test were used to test for

statistically significant differences across three age groups, gender and three diagnostic status based groups.

- Structural Equation Modelling (SEM) with Mplus version 6 was used for hypotheses testing. Four a priori models were ultimately presented, which clarify the nature of the dynamic interaction that takes place between measured variables, and how it predicts proneness to developing bipolar disorder. Furthermore, Mplus was used to test for significant differences between models based on age, gender and diagnostic status.
- Cluster and discriminant analyses were performed with SPSS to substantiate the SEM analysis, and better understand the characteristics of those at risk of developing bipolar disorder. Discriminant analysis is useful in predictive research because it helps with the identification of a profile that predicts group membership. In other words, it helps identify for example who is likely to belong to the group of ‘at risk of developing bipolar disorder’, based on the profile constituted by the responses given to all measured variables.

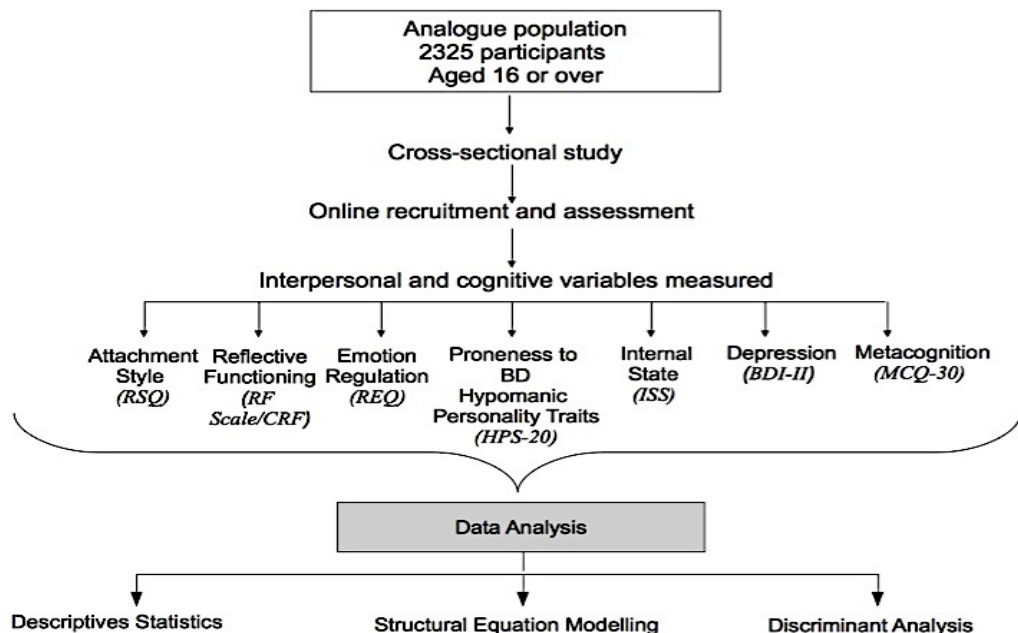


Figure 3.1 Diagrammatic representation of the main study's methodology

Section 4

Statistical analysis and Results

Section 4

Statistical analysis and results

Introduction

The following section will present the results from the data that was gathered online, with the objective to better understand the role that developmental factors play in vulnerability to bipolar disorder. Firstly, descriptive statistics will be provided to summarize the main features that characterize the recruited sample, including demographic information and mental health indices (see Appendix 13). Measures of central tendency, reliability of the scales and dispersion of the measured variables will also be examined. The main part of this section will address the study's hypotheses through group mean comparisons (t-test and ANOVA), Structural Equation Modelling and Discriminant Analysis. Lastly, the conclusions drawn with regards to the supported and rejected hypotheses will be presented.

4.1 Descriptive Statistics

4.1.1 Sample's demographics

A total of 2,325 participants constituted the sample for this study. The vast majority (N=2,225) provided with complete entries, whilst only a minority (N=100; 4.3%) failed to complete the reflective functioning task, thus did not answer the six open questions regarding childhood experiences (see Section 3 for details). The gender

distribution was skewed with 81.6% of the participants being female (see Chart 4.1). However, due to the large number of participants recruited, the relatively small percentage of men (18.4%) still corresponded to a significantly large number (N=427). This tendency is replicated for all other demographic variables. The age range was wide-ranging from 16 to 90 years, with the majority of participants reporting being younger than 36 years of age (see Chart 4.2). In terms of ethnic background, most of the participants described themselves as 'White Other' (see Chart 4.3). Given that most participants were quite young, it is not surprising that a large proportion (68%) described themselves as either 'single - never married' or 'in a relationship - but not married' (see Chart 4.4). The most selected category to describe employment status was 'student' (36.2%), closely followed by 'full-time employee' (see Chart 4.5). Lastly, the majority of the participants selected the category 'none of the above' to describe their education level (see Chart 4.6). One possible reason is that most participants were not British (77%), and therefore might not be familiar with the chosen labels to describe education qualifications in the survey. The fact that the majority of the participants described themselves as 'white other' or any other ethnic background apart from British confirms this assumption. Therefore, given that most of the sample was not British and the UK centric nature of the qualifications listed, there is an increased possibility of significant errors in the respondents' answers to this question. After acknowledging this limitation, it would appear that the sample is approximately evenly split between those who have attended university and those who have not.

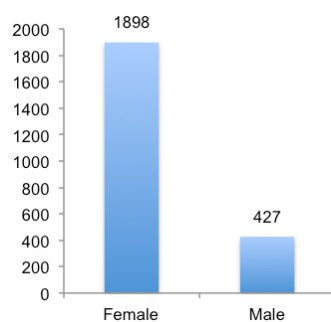
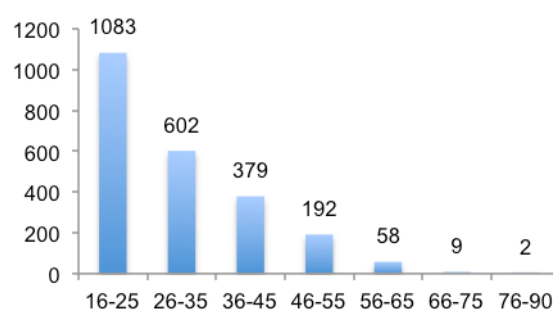
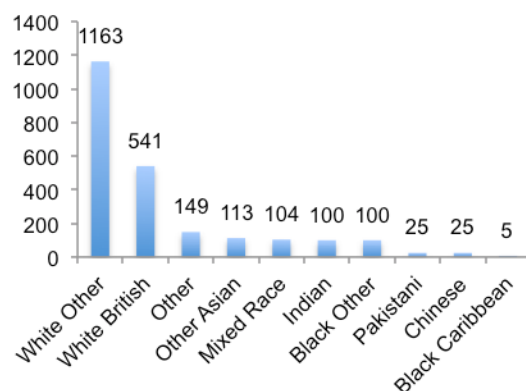
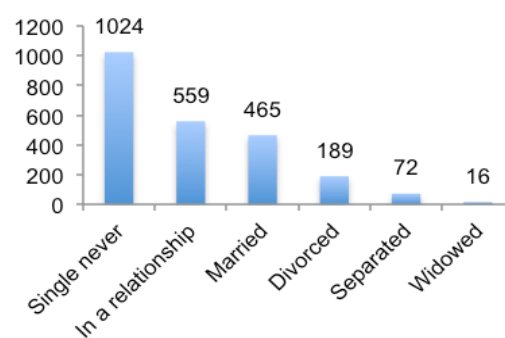
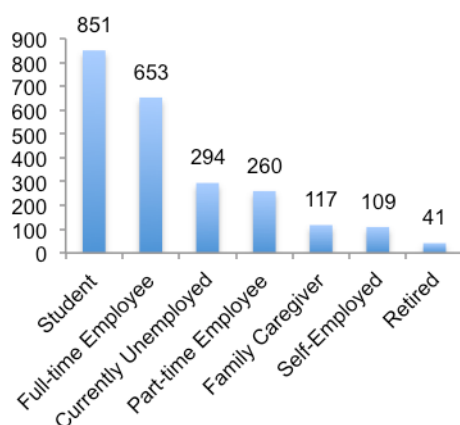
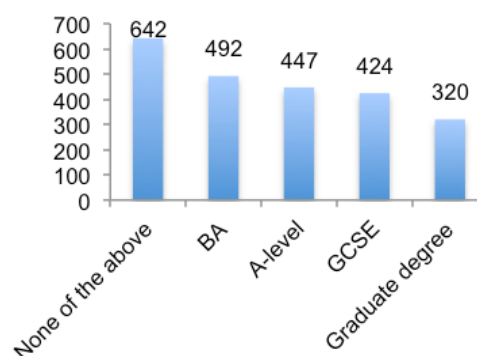
Chart 4.1 Participants' Gender¹Chart 4.2 Participants' Age¹

Chart 4.3 Participants' Ethnicity

Chart 4.4 Participants' Marital Status¹Chart 4.5 Participants' Employment Status¹Chart 4.6 Participants' Education Level¹

¹ Note that the unit of measurement on charts 4.1 to 4.7, 4.9, 4.11 and 4.13 is number of participants

4.1.1.1 Receiving feedback as a motivator to complete the survey

After completion of the survey, participants were asked 4 final questions: 1) whether they wanted to see their feedback, 2) whether they gave consent to be contacted in future to take part in more research, and 3) whether or not they wanted to enter a prize draw with the opportunity to win an iPad. If either of the last two questions was answered affirmatively then a valid email address was required. Analysing the responses to these questions provides us with some insight into the likely motivations of participants to complete the survey, since they were aware of the incentives from the beginning. As expected, the vast majority of participants chose to see their results after completion of the survey (N=2087; 90%). This supports the notion that providing immediate feedback is an effective way to encourage people to complete a survey. Almost 60% (N=1392) of the sample gave consent to be contacted in the future, which suggests an interest in participating in research and thus one could infer that taking part in research is a motivator in itself for some people, in this particular case for more than half of the participants. Having said this, it is possible respondents only indicated interest in participating in more research on the assumption that it would also provide insight into their personalities. Lastly, the opportunity to enter a prize draw and win an iPad seemed like a good incentive for about 55% (N=1282) of the sample. In summary, in this sample, getting feedback appeared to be a very good motivator, much more effective than the opportunity to enter a prize draw to win an iPad (see Chart 4.7). Only 7.9% of the sample did not provide an answer to these motivation related questions (N=184).

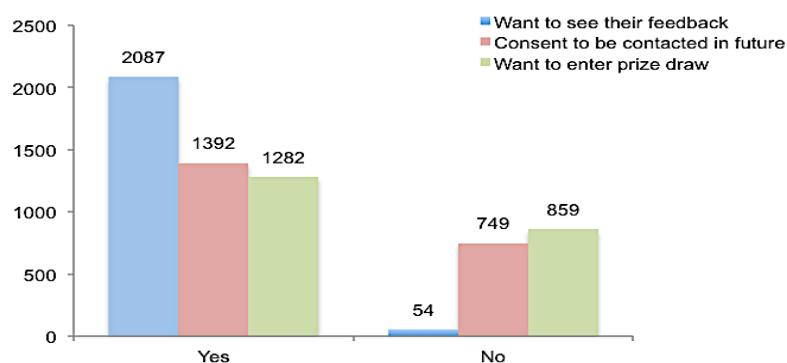


Chart 4.7 Participants' Motivation to complete the survey¹

4.1.1.2 Summary of sample's demographic characteristics

The details presented above describe a sample comprised predominantly of young white non-married women, well educated and who are currently either studying or working a full-time job. One could infer from the results regarding 'wanting to receive feedback' that most participants in this sample have an interest in learning more about themselves.

4.1.2 Mental Health Sample's Characteristics

Participants' mental health was explored through questions addressing seeking help for emotional difficulties, prescription medication intake and mental health diagnosis. If respondents reported to have sought help associated to emotional distress, they were questioned about the persistence of this issue, prescription medication taken and mental health diagnosis. On the contrary, if they reported not to have sought help, they were redirected to the first question of the Hypomanic Personality Scale to immediately begin the survey. More than half of the sample

(N=1323; 57%) reported having sought help at some point in their lives, for either emotional distress or mental health difficulties. The main reason reported as the cause for having sought help was feeling depressed (see Charts 4.8 and 4.9). Out of these participants 74% reported that the problem was still ongoing, and 59% were taking medication, with the most frequently selected prescription being antidepressants (N=557) followed by anxiolytics (N=335) (see Charts 4.10 and 4.11). Lastly, participants who reported having sought help were asked whether they held a mental disorder diagnosis. Most answered positively, with 74% reporting to have been diagnosed by a mental health professional with one or more mental disorders. The three most frequently selected categories were depression (N=640), anxiety (N=555) and bipolar disorder (N=478) (see Charts 4.12 and 4.13).

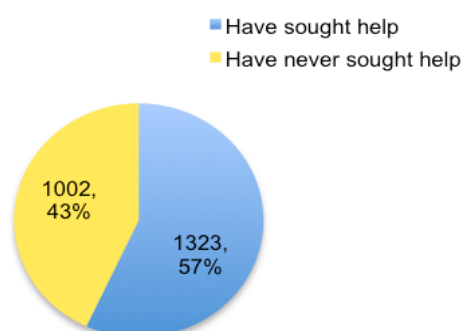


Chart 4.8 Participants who sought help for emotional problems

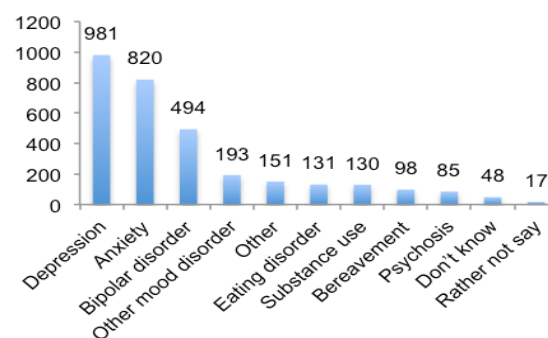


Chart 4.9 Participants' report of motives for which they have sought help¹

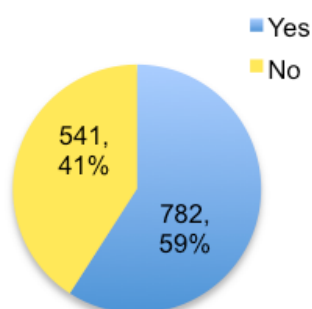


Chart 4.10 Participants who take prescribed medication

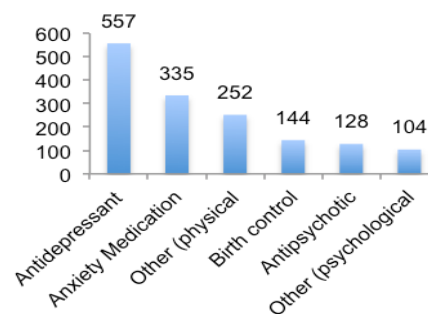


Chart 4.11 Participants' report of prescription medication¹

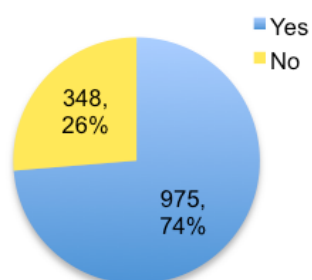


Chart 4.12 Participants who have a mental health diagnosis

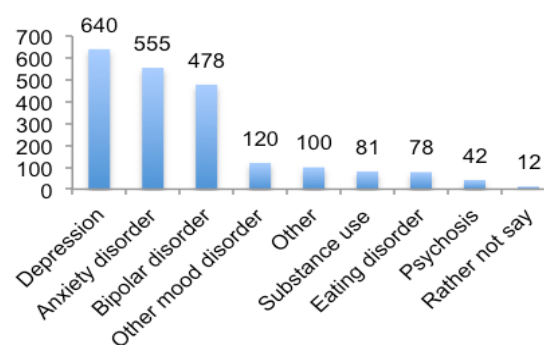


Chart 4.13 Participants' report of mental health diagnosis¹

4.1.2.1 Summary of sample's mental health characteristics

The data presented above depicts a sample in which most people have sought help for emotional difficulties, in particular for anxiety and mood instability, and reported that the problem was still ongoing. Consistent with this finding, the majority of those who had sought help had been diagnosed with a mood instability or anxiety disorder and were taking medication for it.

4.2 Means and group comparisons

All scales and subscales' reliability coefficients and normality tests' results, along with means and standard deviations will be presented in this section. In addition, the sample was categorised into groups based on age, gender and diagnosis with the purpose of exploring the impact of these demographic factors on all measured variables; ANOVA or independent sample t-test were used to explore any group

differences. The sample was divided in three age groups: The first group was labelled 'Young' (N=1083) and included all of those participants between 16 and 25 years of age. The second group was labelled 'Adults' (N=602) and comprised all of those between the ages of 26 to 35. Lastly, the third group was labelled 'Older' (N=640) and included everyone who reported to be 36 years of age or older. The sample was also split in three groups based on diagnosis condition. The first group was labelled 'No Diagnosis' (N=1350) and included all of those participants who, irrespective of whether they had or had not sought help for emotional problems, did not hold a mental health diagnosis. The second group was labelled 'BD Diagnosis' (N=478) and included all of those who reported to have been diagnosed with bipolar disorder by a mental health professional. Lastly, the third group was labelled 'Other Diagnosis' (N=497) and included all of those participants who reported to have been diagnosed with a mental health disorder other than bipolar disorder. The normality of the scores' distributions was assessed graphically (histograms) instead of using the Kolmogorov-Smirnov test of normality. This decision was based on the fact that this test is too sensitive to large sample sizes, which means that results are often significant, suggesting the violation of the assumption of normality, even when this is incorrect (Pallant, 2005).

4.2.1 The Hypomanic Personality Scale (HPS)

In this sample, the HPS proved to be a reliable measure of hypomania, with a Chronbach Alpha coefficient of .78. The normality of the scores' distribution was assessed across the overall sample and by groups. The histograms were indicative of

normally distributed data (see Appendix 9), thus parametric tests were used to further analyse this data. The mean HPS score across the sample was 10.44 ($N=2325$; $SD \pm 3.85$). The HPS mean scores per group can be seen in Table 4.1. The statistical significance of the differences found in HPS mean scores by group, was analysed using independent-samples t-test and ANOVA.

Age and hypomanic personality:

There was a statistically significant group difference at the level of $p < .05$, between the group means [$F(2, 2322)=7.58, p=.000$]. However, in spite of it being statistically significant, the actual impact of age on hypomania scores was very small. The effect size calculated using eta squared was 0.01, which corresponds to a small effect size based on Cohen's classification (Pallant, 2005). Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'Young' ($M=10.67, SD=3.62$) was significantly different from the mean score for both the 'Adults' ($M=10.14, SD=4.02$) and the 'Older' ($M=10.16, SD=4.02$) groups. These last two groups did not significantly differ in mean scores of hypomania.

Gender and hypomanic personality:

There was no statistically significant difference in the mean score for females ($M=10.38, SD=3.82$) and males [$M=10.73, SD=3.98; t(2323)=-1.72, p=.085$]. The effect size of gender on hypomania was very small with an eta squared value of 0.001.

Diagnosis and hypomanic personality:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 134.76$, $p = .000$]. The effect size calculated using eta squared was 0.10, which corresponds to a large effect size. Post-hoc comparisons with Tukey HSD test showed that the mean score for group ‘BD Diagnosis’ ($M = 12.86$, $SD = 3.09$) was significantly different from both the ‘No Diagnosis’ ($M = 9.71$, $SD = 3.82$) and the ‘Other Diagnosis’ ($M = 10.09$, $SD = 3.65$) group. These last two groups did not significantly differ in mean scores on the HPS.

Table 4.1 Hypomanic Personality Scale (HPS) mean scores

		Mean (SD)
Overall Sample	N=2325	10.44 (3.85)
Age Range	Young (18-25)	10.67 (3.62)
	Adults (26-35)	10.14 (4.02)
	Older (> 35)	10.16 (4.02)
Gender	Female	10.38 (3.82)
	Male	10.73 (3.98)
Diagnosis	No Diagnosis	9.71 (3.82)
	BD Diagnosis	12.86 (3.09)
	Other Diagnosis	10.09 (3.65)

4.2.2 The Internal State Scale (ISS)

In this sample, the four ISS subscales showed good internal consistency and reliability, with Chronbach’s Alpha coefficients ranging from .80 to .82. The

Depression Index (DI) had an alpha coefficient of .82, whilst the Well Being (WB) subscale was reliable with an alpha of .80. Similarly the Activation Index's (AI) reliability coefficient was of .81 whilst the Perceived Conflict or overall psychopathology index (PC) subscale was reliable with an alpha of .80. Normality of the subscale-scores' distribution was assessed across the overall sample, and by groups. The histograms suggested mixed results, with some of the subscales' scores being normally distributed whilst others were not (see Appendix 9). However, given the large number of participants comprising the sample, it was deemed appropriate to utilize parametric tests to further analyse this data. According to consulted literature (Pallant, 2005) the violation of the assumption of normality does not cause significant problems with large enough samples.

The mean scores per subscale in both the overall sample and per group are shown in Table 4.2. The statistical significance of the differences found across groups, was analysed using independent-samples t-test and ANOVA.

Age and depression:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 17.06, p = .000$]. However, in spite of it being statistically significant, the actual difference in mean scores was small. The effect size calculated using eta squared was 0.01. Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'Young' ($M = 58.69, SD = 59.65$) was significantly different from the mean score for both the 'Adults' ($M = 73.06, SD = 65.99$) and the 'Older' ($M = 74.61, SD = 64.23$) groups. These last two groups did not significantly

differ in mean depression scores.

Gender and depression:

There was a statistically significant difference in the mean score for females ($M=68.27$, $SD=64.26$) and males [$M=60.23$, $SD=56.97$; $t(692)=2.57$, $p=.010$], but the effect size was very small, with an eta squared value of 0.002.

Diagnosis and depression:

A statistically significant difference at the level of $p<.05$, between the groups means [$F(2, 2322)=171.79$, $p=.000$] was found. The effect size was large with an eta squared value of 0.13. Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'BD Diagnosis' ($M=104.60$, $SD=63.74$) was significantly different from the mean score for both the 'No Diagnosis' ($M=48.89$, $SD=54.94$) and the 'Other Diagnosis' ($M=79.05$, $SD=64.65$) group. These last two groups also significantly differed in mean scores on the ISS depression index.

Age and well being:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=12.74$, $p=.000$]. However, in spite of it being statistically significant, the effect size was small with an eta squared value of 0.01. Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'Young' ($M=148.20$, $SD=75.19$) was significantly different from the mean score for both the 'Adults' ($M=131.88$, $SD=75.01$) and the 'Older' ($M=133$, $SD=75.01$) groups. These last two groups did not significantly differ in well being mean scores.

Gender and well being:

There was a statistically significant difference in the mean score for females ($M=138.10$, $SD=75.19$) and males [$M=147.31$, $SD=76.39$; $t(2323)=-2.28$, $p=.022$]. The effect size was calculated and results indicated that it was very small with an eta squared value of 0.002.

Diagnosis and well being:

A statistically significant difference at the level of $p<.05$, between the groups means [$F(2, 2322)=92.59$, $p=.000$] was found. The effect size was moderate, according to Cohen's classification, with an eta squared value of 0.07. Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'No Diagnosis' ($M=157.12$, $SD=70.98$) was significantly different from the mean score for both the 'BD Diagnosis' ($M=112.34$, $SD=78.25$) and the 'Other Diagnosis' ($M=119.11$, $SD=71.67$) group. These last two groups did not significantly differ from one another.

Age and activation:

There was no statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=1.77$, $p=.169$]. The effect size for this mean difference was very small, with an eta squared of 0.001.

Gender and activation:

There was no statistically significant difference in the mean score for females ($M=135.89$, $SD=111.36$) and males [$M=142.83$, $SD=104.39$; $t(2323)=-1.17$, $p=.239$],

and the calculated eta squared indicated a very small effect size (0.0005) of gender on activation.

Diagnosis and activation:

There was a statistically significant difference on activation, at the level of $p < .05$, between the groups [$F(2, 2322) = 51.37, p = .000$]. However the eta squared value of 0.04 indicated a small effect size. Post-hoc comparisons using the Tukey HSD test showed that the mean score for group 'BD Diagnosis' ($M = 181.72, SD = 102.39$) was significantly different from the mean score for both the 'No Diagnosis' ($M = 125.47, SD = 102.39$) and the 'Other Diagnosis' ($M = 126.08, SD = 102.54$). These last two groups did not significantly differ in mean scores.

Age and perceived conflict:

There was a statistically significant difference at the level of $p < .05$, between group means [$F(2, 2322) = 4.01, p = .018$], but the effect size was very small with an eta squared of 0.003. The Post-hoc comparisons (Tukey HSD) showed only the 'Young' group ($M = 142.95, SD = 104.18$) was significantly different from the 'Adults' group ($M = 158.97, SD = 120.02$).

Gender and perceived conflict:

There was no statistically significant difference in the mean score for females ($M = 150.26, SD = 113.92$) and males [$M = 139.95, SD = 101.33; t(690.21) = 1.85, p = .064$], whilst the effect size was very small (eta squared value of 0.001).

Diagnosis and perceived conflict:

There was a statistically significant difference at the level of $p < .05$, between group means [$F(2, 2322) = 125.59, p = .000$]. The effect size was moderate (0.09), and post-hoc comparisons (Tukey HSD test) showed that the three groups differed significantly from one another. ‘BD Diagnosis’ ($M = 211.53, SD = 120.99$) was significantly different from both the ‘No Diagnosis’ ($M = 122.73, SD = 98.69$) and the ‘Other Diagnosis’ ($M = 157.26, SD = 110.64$) group, whilst these last two also differed significantly in mean scores on this subscale.

Table 4.2 Internal State Scale (ISS) mean scores

		Mean (SD)			
		DI*	WB*	AI*	PC*
Overall Sample	N = 2325	66.79 (63.05)	139.79 (75.48)	137.17 (110.13)	148.37 (111.76)
Age Range	Young (18-25)	58.69 (59.65)	148.20 (75.19)	140.48 (104.09)	142.95 (104.18)
	Adults (26-35)	73.06 (65.99)	131.88 (75.01)	138.49 (116.27)	158.97 (120.02)
	Older (> 35)	74.61 (64.23)	133.00 (75.01)	130.31 (113.90)	147.56 (115.51)
Gender	Female	68.27 (64.26)	138.10 (75.19)	135.89 (111.36)	150.26 (113.92)
	Male	60.23 (56.97)	147.31 (76.39)	142.83 (104.39)	139.95 (101.33)
Diagnosis	No Diagnosis	48.89 (54.94)	157.12 (70.96)	125.47 (102.39)	122.73 (98.69)
	BD Diagnosis	104.60 (63.74)	112.34 (78.25)	181.72 (126.47)	211.53 (120.99)
	Other	79.05 (64.07)	119.11 (71.67)	126.08 (102.54)	157.26 (110.64)

* DI=Depression Index / WB=Well-Being / AI=Activation Index / PC=Perceived Conflict

4.2.3 The Relationship Scale Questionnaire (RSQ)

In this sample, the RSQ subscales’ internal consistency was moderate to low, with

Preoccupied attachment showing the lowest alpha ($\alpha=.28$) and Fearful the highest ($\alpha=.72$). Secure attachment showed a less than acceptable alpha of .42 and so did the Dismissive subscale with an alpha of just .56. Therefore, factor analysis was used to identify the structure of the scale in this particular sample. Principal axis factoring method with a Promax rotation was conducted in SPSS, to analyse the underlying structure of the 17 items that make up the four original subscales of the RSQ. The Kaiser-Meyer Olkin measure of sampling adequacy indicated the sample and data were suitable for factor analysis (KMO=.800). The results of the oblique rotation of the initial solution are shown in Table 4.3. The solution pointed at a three dimensional structure, with the emergent factors explaining 50% of the variance. One item, 'I am comfortable without close emotional relationships', was dropped given that it loaded poorly in all identified factors (<0.3), leaving only 16 items in the final solution. The three factors that emerged were representative of types of insecure attachment, and were given names that reflected the nature of the questions corresponding to them. Items that made reference to the importance of being independent constituted Factor 1, and thus it was labelled 'Autonomous (AT)'; Factor 2 contained aspects of worrying about relationships and was labelled 'Anxious (AX)'; Factor 3 was characterized by items referring to avoidance of close relationships, and thus was labelled 'Avoidant (AV)'. The three dimensions showed an acceptable to good reliability with alpha coefficients of .77, .74 and .62 respectively. Table 4.4 shows the final solution, which was used in this sample's analysis of attachment style. Scores for these re-constructed subscales were computed as per the original scoring instructions - that is by taking the average values as indicators of someone's attachment patterns.

Normality of the scores was assessed on the overall sample, and by groups. The histograms suggested mixed results (see Appendix 9), but parametric tests were used to explore mean differences across groups (t-test and ANOVA). Mean scores per subscale in the overall sample and per group, are shown in Table 4.5.

Table 4.3 Oblique Rotated Solution for the RSQ

	Pattern Matrix ^a		
	1	2	3
It is very important to me to feel independent.	.763		
It is very important to me to feel self-sufficient.	.682		-.331
I prefer not to depend on others.	.636		
I find it difficult to depend on other people.	.597		
I am comfortable depending on other people.	-.575		
I worry that others don't value me as much as I value them.		.704	
I worry about having others not accept me.		.682	
I worry about being alone.		.621	
I find that others are reluctant to get as close as I would like.		.520	
I worry that I will be hurt if I allow myself to become too close to others.		.482	
I want to be completely emotionally intimate with others.		.452	-.390
I find it difficult to trust others completely.		.346	
I am comfortable having other people depend on me.	.319		-.653
I prefer not to have other people depend on me.			.624
I am somewhat uncomfortable being close to others.			.531
I find it easy to get emotionally close to others.			-.430

Extraction Method: Principal Axis Factoring.

Rotation Method: Promax with Kaiser Normalization.

^a*Rotation converged in 4 iterations.*

Table 4.4 Final Solution for the RSQ

Factor	Items
Autonomous (AT)	It is very important to me to feel independent It is very important to me to feel self-sufficient I prefer not to depend on others I find it difficult to depend on other people I am comfortable depending on other people *
Anxious (AX)	I worry that others don't value me as much as I value them I worry about having others not accept me I worry about being alone I find that others are reluctant to get as close as I would like I worry that I will be hurt if I allow myself to become too close to others I want to be completely emotionally intimate with others I find it difficult to trust others completely
Avoidant (AV)	I am comfortable having other people depend on me * I prefer not to have other people depend on me I am somewhat uncomfortable being close to others I find it easy to get emotionally close to others *

*Item loaded negatively into its respective factor

Age and autonomous insecure attachment:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 30.35, p = .000$]. However, in spite of it being statistically significant, the effect size calculated was very small, with an eta squared of 0.02. Post-hoc comparisons using the Tukey HSD test showed that group 'Young' ($M = 3.64, SD = .78$) was significantly different in mean score, from both the 'Adults' ($M = 3.79, SD = .78$) and the 'Older' ($M = 3.94, SD = .76$) groups. The 'Adults' and the 'Older' groups also significantly differed in average score for this attachment pattern.

Gender and autonomous insecure attachment:

There was a statistically significant difference in the mean score for females

($M=3.79$, $SD=.78$) and males [$M=3.62$, $SD=.76$; $t(2323)=4.05$, $p=.000$], but the effect size of this difference was very small, with an eta squared value of 0.007.

Diagnosis and autonomous insecure attachment:

A statistically significant difference at the level of $p<.05$, between group means was found [$F(2, 2322)=35.20$, $p=.000$]. However, the effect size was small with an eta squared value of 0.03. Post-hoc comparisons (Tukey HSD test) showed significant differences between all groups. The mean score for group 'BD Diagnosis' ($M=3.98$, $SD=.79$) was significantly different from the mean score for both the 'No Diagnosis' ($M=3.65$, $SD=.75$) and the 'Other Diagnosis' ($M=3.83.05$, $SD=.80$) group. These last two groups also significantly differed in mean scores on this subscale.

Age and anxious insecure attachment:

There was no statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=2.31$, $p=.099$]. The calculated eta squared indicated a very small effect size of 0.001.

Gender and anxious insecure attachment:

There was a statistically significant difference in the mean score across gender groups with females scoring higher ($M=3.30$, $SD=.79$) than males [$M=3.11$, $SD=.75$; $t(2323)=4.60$, $p=.000$]. However, the effect size, as indicated by an eta squared value of 0.009, was very small.

Diagnosis and anxious insecure attachment:

A statistically significant difference at the level of $p<.05$, between the groups means

[$F(2, 2322) = 113.19, p = .000$] was found. The effect size was moderate with an eta squared value of 0.08. Post-hoc comparisons using the Tukey HSD test showed that the mean scores of all groups significantly differed from one another. The mean score for group 'BD Diagnosis' ($M = 3.63, SD = .76$) was significantly higher than the mean score for both the 'No Diagnosis' ($M = 3.07, SD = .72$) and the 'Other Diagnosis' ($M = 3.43, SD = .75$) group, whilst these last two groups also significantly differed in mean scores on anxious attachment style.

Age and avoidant insecure attachment:

A statistically significant difference at the level of $p < .05$, between the group means was found [$F(2, 2322) = 24.53, p = .000$], but with a small effect size as indicated by the eta squared value of 0.02. The post-hoc test (Tukey HSD) showed that the mean score for all groups were significantly different. Group 'Young' ($M = 2.51, SD = .78$) was significantly different from the mean score for both the 'Adults' ($M = 2.66, SD = .80$) and the 'Older' ($M = 2.79, SD = .82$) groups, whilst the 'Adults' and the 'Older' groups also significantly differed in means scores for this subscale.

Gender and avoidant insecure attachment:

There was no statistically significant difference in the mean score for females ($M = 2.62, SD = .80$) and males [$M = 2.65, SD = .85; t(2323) = -0.72, p = .471$]. The effect size was of very small magnitude, with an eta squared value of just 0.0002.

Diagnosis and avoidant insecure attachment:

A statistically significant difference at the level of $p < .05$, between the groups means

[$F(2, 2322) = 70.11, p = .000$] was found. The effect size was moderate with an eta squared value of 0.06. Post-hoc comparisons using the Tukey HSD test showed significant differences between all three groups. 'BD Diagnosis' ($M = 2.93, SD = .84$) scored significantly higher than both the 'No Diagnosis' ($M = 2.47, SD = .75$) and the 'Other Diagnosis' ($M = 2.77, SD = .83$) group, whilst these last two also significantly differed in mean scores.

Table 4.5 Relationship Scale Questionnaire (RSQ) mean scores

		Mean (SD)		
		AT*	AX*	AV*
Overall Sample	N = 2325	3.76 (0.78)	3.26 (0.79)	2.63 (0.81)
Age Range	Young	3.64 (0.78)	3.27 (0.76)	2.51 (0.78)
	Adults	3.79 (0.78)	3.31 (0.82)	2.66 (0.80)
	Older	3.94 (0.76)	3.22 (0.80)	2.79 (0.82)
Gender	Female	3.79 (0.78)	3.30 (0.79)	2.62 (0.80)
	Male	3.62 (0.76)	3.11 (0.75)	2.65 (0.85)
Diagnosis	No Diagnosis	3.65 (0.75)	3.07 (0.76)	2.47 (0.75)
	BD Diagnosis	3.98 (0.79)	3.63 (0.72)	2.93 (0.84)
	Other Diagnosis	3.83 (0.80)	3.43 (0.75)	2.77 (0.83)

* AT= Autonomous Insecure Attachment / AX= Anxious Insecure Attachment / AV= Avoidant Insecure Attachment

4.2.4 The Beck Depression Inventory (BDI-II)

In this sample the BDI-II presented excellent internal consistency, with a Chronbach's Alpha coefficient of .95. The normality of the scores' distribution, was assessed across the overall sample and by groups. The histograms although

indicative of mixed results, were predominantly suggestive of non-normally distributed data (see Appendix 9).

Independent-samples t-test and ANOVA were used in subsequent analysis of mean differences across groups. The mean depression score, as measured by the BDI-II, across the whole sample was 18.51 ($N=2325$; $SD \pm 13.92$). Mean scores per group are shown in Table 4.6.

Age and BDI-II depression scores:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322)=37.50$, $p=.000$]. However, the effect size was small, with an eta squared value of 0.03. Post-hoc comparisons using the Tukey HSD test showed that group ‘Young’ ($M=15.89$, $SD=12.52$) was significantly different from both the ‘Adults’ ($M=20.42$, $SD=15.09$) and the ‘Older’ ($M=21.16$, $SD=14.25$) groups, whilst these last two groups did not significantly differed. These results are consistent with those of the ISS depression index.

Gender and BDI-II depression scores:

There was a statistically significant difference in the mean score for females ($M=19.13$, $SD=14.14$) and males [$M=15.75$, $SD=12.54$; $t(2323)=4.55$, $p=.000$], with females scoring substantially higher than men. However, the effect size was very small (eta squared value of 0.008). These results are consistent with those of the ISS depression index.

Diagnosis and BDI-II depression scores:

There was a statistically significant difference at the level of $p < .05$, between the groups [$F(2, 2322) = 427.75$, $p = .000$]. The effect size calculated using eta squared was 0.27, which corresponds to a large effect size. Post-hoc comparisons using the Tukey HSD test showed that the mean score for depression was significantly different between the three groups. Group 'BD Diagnosis' ($M = 30.72$, $SD = 13.49$) scored significantly higher than both the 'No Diagnosis' ($M = 12.84$, $SD = 10.53$) and the 'Other Diagnosis' ($M = 22.18$, $SD = 13.67$) groups, whilst the last two also significantly differed in depression mean scores, with the 'Other Diagnosis' groups scoring substantially higher than the 'No Diagnosis' group. These results are consistent with those of the ISS depression index.

Table 4.6 Beck Depression Inventory (BDI-II) mean score

		Mean (SD)
Overall Sample	N=2325	18.51 (13.92)
Age Range	Young (18-25)	15.89 (12.52)
	Adults (26-35)	20.42 (15.09)
	Older (> 35)	21.16 (14.25)
Gender	Female	19.13 (14.14)
	Male	15.75 (12.53)
Diagnosis	No Diagnosis	12.84 (10.53)
	BD Diagnosis	30.72 (13.49)
	Other Diagnosis	22.18 (13.67)

4.2.5 The Metacognitions Questionnaire (MCQ-30)

In this sample, the five MCQ subscales showed good internal consistency and reliability. The scale as a whole (overall score - TOT) also showed good internal consistency with an alpha coefficient of .93. The ‘positive beliefs about worry (PB)’, ‘negative beliefs about worry (NB)’ and ‘cognitive confidence (CC)’ subscales had a reliability coefficient of .90, whilst the ‘need to control thoughts (NCT)’ and the ‘cognitive self-consciousness (CSC)’ subscales had alpha coefficients of .81 and .83 respectively. Normality was assessed across the overall sample, and by groups, and the histograms yielded mixed results (see Appendix 9). The mean scores per subscale in both the overall sample and per group are presented in Table 4.7, along with the total score average across the whole sample and by groups. The statistical significance of the differences found across groups, was analysed using independent-samples t-test and ANOVA.

Age and metacognition:

There was no statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 2.28, p = .102$]. The effect size was very small, as indicated by an eta squared value of just 0.001.

Gender and metacognition:

There was no statistically significant difference in the mean score for females ($M = 65.10, SD = 17.84$) and males [$M = 65.46, SD = 16.65; t(664.61) = -0.40, p = .688$]. Estimation of the eta squared value shows a very small effect size of 0.00006.

Diagnosis and metacognition:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 158.42, p = .000$]. The effect was large with an eta squared value of 0.12. Post-hoc comparisons using the Tukey HSD test showed that the metacognition mean score was significantly different between the three groups. Group 'No Diagnosis' ($M = 60.41, SD = 15.85$) was significantly different from the mean score for both the 'BD Diagnosis' ($M = 75.59, SD = 17.32$) and the 'Other Diagnosis' ($M = 68.07, SD = 17.58$) groups, whilst these last two groups also significantly differed in metacognition average scores.

Age and positive beliefs about worry:

There was no statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 2.25, p = .104$]. The effect size was very small, as indicated by an eta squared value of 0.001.

Gender and positive beliefs about worry:

There was no statistically significant difference in the mean score for females ($M = 11.01, SD = 4.60$) and males [$M = 11.10, SD = 4.55; t(2323) = -0.35, p = .726$]. An eta squared value of 0.00005 indicates a very small effect size.

Diagnosis and positive beliefs about worry:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 10.92, p = .000$]. However the effect size was small, with an eta squared value of 0.01. Post-hoc comparisons using the Tukey HSD test showed

that the ‘BD Diagnosis’ group differs significantly from the other two groups, whilst these do not differ between each other. ‘BD Diagnosis’ ($M=11.88$, $SD=5.02$) was significantly different from the mean score for both the ‘No Diagnosis’ ($M=10.75$, $SD=4.35$) and the ‘Other Diagnosis’ ($M=10.99$, $SD=4.67$) groups.

Age and negative beliefs about worry:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=7.89$, $p=.000$]. However, the eta squared value of just 0.006 indicates a very small effect size. Post-hoc comparisons using the Tukey HSD test showed only the difference between group ‘Young’ ($M=13.24$, $SD=14.34$) and ‘Adults’ ($M=14.34$, $SD=5.82$) was statistically significant.

Gender and negative beliefs about worry:

There was a statistically significant difference in the mean score for females ($M=13.93$, $SD=5.63$) and males [$M=12.61$, $SD=5.18$; $t(671.92)=4.70$, $p=.000$]. However, eta squared value of just 0.008 indicates a very small effect size.

Diagnosis and negative beliefs about worry:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=209.16$, $p=.000$]. The effect size was large, with an eta squared value of 0.15. Post-hoc comparisons using the Tukey HSD test showed that all of the groups differed from one another. ‘BD Diagnosis’ ($M=17.08$, $SD=5.36$) was significantly different from the mean score for both the ‘No Diagnosis’ ($M=11.91$, $SD=4.87$) and the ‘Other Diagnosis’ group ($M=15.27$, $SD=5.57$), whilst

these also differed between each other.

Age and cognitive confidence:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 24.64, p = .000$]. However, the effect size was only of small magnitude, with an eta squared value of just 0.02. According to the post-hoc comparisons (Tukey HSD test) all three groups scored significantly different from each other. Group 'Young' ($M = 11.37, SD = 4.66$) was significantly different from both the 'Adults' ($M = 12.31, SD = 5.38$) and the 'Older' ($M = 13.10, SD = 5.25$), whilst these also differed significantly in their mean score for cognitive confidence.

Gender and cognitive confidence:

No statistically significant difference in the mean score for females ($M = 12.10, SD = 5.11$) and males [$M = 12.05, SD = 4.89; t(2323) = 0.20, p = .845$] was found. An eta squared value of just 0.00001 was indicative of a very small effect size.

Diagnosis and cognitive confidence:

A statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 164.40, p = .000$] was found. The effect size was large, as indicated by the eta squared value of 0.12. Post-hoc comparisons using the Tukey HSD test showed that all of the groups differed from one another. The 'BD Diagnosis' group ($M = 15.23, SD = 5.52$) was significantly different from both the 'No Diagnosis' ($M = 10.73, SD = 4.25$) and the 'Other Diagnosis' group ($M = 12.78, SD = 5.21$). These last two groups also differed significantly in mean scores for cognitive confidence.

Age and need to control thoughts:

No impact of age on ‘need to control thoughts’ was found, with no statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 2.60, p = .074$]. The effect size was very small with an eta squared of 0.002.

Gender and need to control thoughts:

A statistically significant difference in the mean score for females ($M = 12.20, SD = 4.54$) and males [$M = 12.84, SD = 4.41; t(2323) = -2.63, p = .008$] was observed, but the effect size was very small (eta squared value 0.003).

Diagnosis and need to control thoughts:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 78.08, p = .000$]. The effect size was medium, with an eta squared of 0.06. Post-hoc comparisons using the Tukey HSD test showed that all of the groups differed from one another. The ‘BD Diagnosis’ group ($M = 14.38, SD = 4.73$) was significantly different from both the ‘No Diagnosis’ ($M = 11.49, SD = 4.14$) and the ‘Other Diagnosis’ group ($M = 12.59, SD = 4.65$). These last two groups also differed significantly in means scores for this subscale.

Age and cognitive self-consciousness:

No statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 1.58, p = .205$] was found. The effect size was very small, with an eta squared of just 0.001.

Gender and cognitive self-consciousness:

A statistically significant difference in the mean score for females ($M=15.85$, $SD=4.44$) and males [$M=16.86$, $SD=4.55$; $t(2323)=-4.26$, $p=.000$] was found. However, the effect size was very small with an eta squared value of just 0.007.

Diagnosis and cognitive self-consciousness:

A statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=22.50$, $p=.000$] was detected. However, the effect size was small with an eta squared of 0.02. Post-hoc comparisons using the Tukey HSD test showed that the 'No Diagnosis' group ($M=15.53$, $SD=4.38$) was significantly different from both the 'BD Diagnosis' ($M=17.02$, $SD=4.37$) and the 'Other Diagnosis' group ($M=16.45$, $SD=4.62$), whilst these did not significantly differed in means scores for cognitive self-consciousness.

Table 4.7 The Metacognitions Questionnaire (MCQ) mean scores

		Mean (SD)					
		TOT*	PB*	NB*	CC*	NCT*	CSC*
Overall Sample	N = 2325	65.17 (17.63)	11.03(4.59)	13.69(5.57)	12.09(5.07)	12.32(4.52)	16.03(4.47)
Age Range	Young (18-25)	64.39(16.60)	11.08(4.51)	13.24(5.30)	11.37(4.66)	12.52(4.32)	16.17(4.37)
	Adults (26-35)	66.26(18.66)	11.26(4.69)	14.34(5.82)	12.31(5.38)	12.29(4.84)	16.05(4.53)
	Older (> 35)	65.45(18.26)	10.73(4.60)	13.83(5.72)	13.10(5.25)	12.01(4.54)	15.78(4.59)
Gender	Female	65.10(17.84)	11.01(4.60)	13.93(5.63)	12.10(5.11)	12.20(4.54)	15.85(4.44)
	Male	65.46(16.65)	11.10(4.55)	12.61(5.18)	12.05(4.89)	12.84(4.41)	16.86(4.55)
Diagnosis	No Diagnosis	60.41(15.85)	10.75(4.35)	11.91(4.87)	10.73(4.25)	11.49(4.14)	15.53(4.38)
	BD Diagnosis	75.59(17.32)	11.88(5.02)	17.08(5.36)	15.23(5.52)	14.38(4.73)	17.02(4.37)
	Other	68.97(17.58)	10.99(4.67)	15.27(5.57)	12.78(5.21)	12.59(4.65)	16.45(4.62)
	Diagnosis						

* TOT=Total score / PB= Positive beliefs about worry / NB=Negative beliefs about worry / CC=Cognitive Confidence / NCT= Need to control thoughts / CSC= Cognitive self-consciousness

4.2.6 The Regulation of Emotions Questionnaire (REQ)

In this sample, the four REQ subscales showed acceptable to good internal consistency with reliability coefficients ranging from .63 to .80: the internal dysfunctional (ID) subscale had a Chronbach's alpha of .78, whilst the internal functional (IF) showed good reliability with an alpha of .73; the external dysfunctional (ED) subscale had the highest alpha coefficient of the four subscales ($\alpha=.80$), whilst the external functional (EF) had the lowest ($\alpha=.63$). Normality of the subscale-scores' distribution was assessed across the overall sample, and by groups. Once more, the histograms yielded mixed results, with some of the subscales' scores being normally distributed whilst others were not (see Appendix 9). Yet, the decision to utilize parametric tests to further analyse this data was reiterated. The mean scores per subscale in both the overall sample and per group can be seen in Table 4.8. The statistical significance of the differences found across groups, was analysed using independent-samples t-test and ANOVA.

Age and internal dysfunctional emotion regulation:

There was no statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=.614, p=.541$]. The effect size was very small, as showed by an eta squared value of just 0.005.

Gender and internal dysfunctional emotion regulation:

There was no statistically significant difference in the mean score for females ($M=12.88, SD=4.76$) and males [$M=12.72, SD=4.56; t(651.41)=.64, p=.528$]. An eta squared value of 0.0001 shows a very small effect size of gender on this variable.

Diagnosis and internal dysfunctional emotion regulation:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 202.20, p = .000$]. An eta squared value of 0.15 indicated a large effect size. Post-hoc comparisons using the Tukey HSD test showed that the mean score was significantly different between the three groups. Group ‘No Diagnosis’ ($M = 11.40, SD = 4.22$) was significantly different from the mean score for both the ‘BD Diagnosis’ ($M = 15.87, SD = 4.49$) and the ‘Other Diagnosis’ ($M = 13.87, SD = 4.63$) groups, whilst these last two also significantly differed in mean scores.

Age and internal functional emotion regulation:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2322) = 15.25, p = .000$]. The effect size was small, as showed by the eta squared value of 0.01. According to the post-hoc comparisons (Tukey HSD test) group ‘Young’ scored significantly different from the other two, whilst these did not differ from each other. Group ‘Young’ ($M = 16.13, SD = 3.91$) was significantly different from both the ‘Adults’ group ($M = 15.52, SD = 3.80$) and the ‘Older’ group ($M = 15.11, SD = 3.65$).

Gender and internal functional emotion regulation:

A statistically significant difference in the mean score for females ($M = 15.61, SD = 3.76$) and males [$M = 16.06, SD = 4.13; t(2323) = -2.21, p = .037$] was detected. However, estimation of an eta squared value of 0.002 shows only a small effect size.

Diagnosis and internal functional emotion regulation:

There was a statistically significant difference at the level of $p < .05$, between the

group means [$F(2, 2322)=35.13, p=.000$]. A small size effect was confirmed by an eta squared value of 0.03. Post-hoc comparisons using the Tukey HSD test showed that the mean score was significantly different between the ‘No Diagnosis’ group and the other two. Group ‘No Diagnosis’ ($M=16.25, SD=3.65$) was significantly different from the mean score for both the ‘BD Diagnosis’ ($M=14.78, SD=3.92$) and the ‘Other Diagnosis’ ($M=15.07, SD=3.98$) groups, whilst these last two did not significantly differed in mean scores.

Age and external dysfunctional emotion regulation:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=6.39, p=.001$]. The effect size was small though, with an eta squared, of just 0.005. According to the post-hoc comparisons done with the Tukey HSD test, there was just one significant mean difference found. Group ‘Young’ ($M=8.59, SD=3.30$) scored significantly different from the ‘Adults’ group ($M=9.24, SD=3.91$) for external dysfunctional emotion regulation strategies.

Gender and external dysfunctional emotion regulation:

An independent-samples t-test showed no statistically significant difference in the mean score for females ($M=8.85, SD=3.63$) and males [$M=8.79, SD=3.64$; $t(644.12)=.31, p=.756$]. The eta squared value of 0.00004 indicates a very small effect size.

Diagnosis and external dysfunctional emotion regulation:

There was a statistically significant difference at the level of $p<.05$, between the groups means [$F(2, 2322)=107.11, p=.000$]. The effect size was moderate with an eta

squared of 0.08. Post-hoc comparisons using the Tukey HSD test indicated significant differences between all groups. Group 'No Diagnosis' ($M=8.14$, $SD=2.97$) was significantly different from both the 'BD Diagnosis' ($M=10.84$, $SD=4.62$) and the 'Other Diagnosis' ($M=8.79$, $SD=3.38$) groups, whilst these last two also significantly differed in mean scores.

Age and external functional emotion regulation:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=27.98$, $p=.000$]. However, the effect size was small, as measured by an eta squared value of just 0.02. According to the post-hoc comparisons (Tukey HSD test) all groups differed significantly from each other. Group 'Young' ($M=11.43$, $SD=3.33$) scored significantly different from both the 'Adults' ($M=10.89$, $SD=3.12$) and the 'Older' group ($M=10.24$, $SD=3.00$), whilst these last two also differed significantly in mean scores.

Gender and external functional emotion regulation:

A statistically significant difference in the mean score for females ($M=11.07$, $SD=3.24$) and males [$M=10.49$, $SD=3.14$; $t(644.93)=3.42$, $p=.000$] was found. However the eta squared value of 0.005 shows the effect size was very small.

Diagnosis and external functional emotion regulation:

There was a statistically significant difference at the level of $p<.05$, between the group means [$F(2, 2322)=42.41$, $p=.000$]. However the effect size was small with an eta squared value of 0.03. Post-hoc comparisons using the Tukey HSD test indicated

significant differences between all groups. Group ‘No Diagnosis’ ($M=11.45$, $SD=3.18$) was significantly different from the mean score for both the ‘BD Diagnosis’ ($M=9.99$, $SD=3.08$) and the ‘Other Diagnosis’ ($M=10.57$, $SD=3.23$) groups, whilst these last two also had significantly different mean scores on the external functional emotion regulation subscale.

Table 4.8 Regulation of Emotion Questionnaire (REQ) mean scores

		Mean (SD)			
		ID*	IF*	ED*	EF*
Overall Sample	N = 2325	12.85 (4.73)	15.69 (3.83)	8.84 (3.62)	10.96 (3.23)
Age Range	Young (18-25)	12.87 (4.66)	16.13 (3.91)	8.59 (3.30)	11.43 (3.33)
	Adults (26-35)	12.98 (4.98)	15.52 (3.80)	9.24 (3.91)	10.89 (3.12)
	Older (> 35)	12.65 (4.59)	15.11 (3.65)	8.88 (3.80)	10.24 (3.00)
Gender	Female	12.88 (4.76)	15.61 (3.76)	8.85 (3.63)	11.07 (3.24)
	Male	12.72 (4.56)	16.06 (4.13)	8.79 (3.54)	10.49 (3.14)
Diagnosis	No Diagnosis	11.40 (4.22)	16.25 (3.65)	8.14 (2.97)	11.45 (3.18)
	BD Diagnosis	15.87 (4.49)	14.78 (3.92)	10.84 (4.62)	9.99 (3.08)
	Other	13.87 (4.63)	15.07 (3.98)	8.79 (3.38)	10.57 (3.23)

* ID= Internal dysfunctional emotion regulation / IF= Internal functional emotion regulation / ED= External dysfunctional emotion regulation / EF= External functional emotion regulation

4.2.7 Reflective Functioning (RF)

Given the nature of the CRF (Fertuck et al., 2012), reflective functioning was not assessed in a way that allowed testing for reliability of the scale. Normality of the

scores distribution was assessed across the overall sample, and by groups. The histograms' results indicated RF scores were normally distributed both across the whole sample and by groups (see Appendix 9). The mean score in both the overall sample and per group are presented in Table 4.9. The statistical significance of the differences found across groups, was analysed using independent-samples t-test and ANOVA.

Age and reflective functioning:

There was no statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2222) = 1.97, p = .139$]. The eta squared value of just 0.001 indicated a very small effect size.

Gender and reflective functioning:

There was a statistically significant difference in the RF mean score for females ($M = 4.40, SD = 1.69$) and males [$M = 3.83, SD = 1.78; t(2223) = 6.06, p = .000$]. However, the estimated eta squared value of 0.01 shows there was only a small effect size.

Diagnosis and reflective functioning:

There was a statistically significant difference at the level of $p < .05$, between the group means [$F(2, 2222) = 15.79, p = .000$]. However, the effect size was small, with an eta squared value of 0.01. Post-hoc comparisons using the Tukey HSD test showed that the mean score was significantly different between the 'BD Diagnosis' group and the other two. Group 'BD Diagnosis' ($M = 4.66, SD = 1.53$) was significantly different from both the 'No Diagnosis' ($M = 4.14, SD = 1.75$) and the

‘Other Diagnosis’ ($M=4.33$, $SD=1.76$) groups, whilst these last two groups did not differ.

Table 4.9 Reflective Functioning (RF) mean score

		Mean (SD)
Overall Sample	N=2325	4.29 (1.72)
Age Range	Young (18-25)	4.21 (1.68)
	Adults (26-35)	4.35 (1.71)
	Older (> 35)	4.37 (1.78)
Gender	Female	4.40 (1.69)
	Male	3.83 (1.78)
Diagnosis	No Diagnosis	4.14 (1.75)
	BD Diagnosis	4.66 (1.53)
	Other Diagnosis	4.33 (1.76)

4.2.8 Summary of group comparisons

The results presented above suggest that diagnosis is the most influential factor on all measured variables. Statistically significant differences across diagnostic groups were found for all 20 measured variables. For 13 of these comparisons, diagnosis had a moderate to large effect. In contrast, gender and age were less influential, with about 50% of all comparisons showing statistical significance. Moreover, even when statistical significance was reached, the effect size was small. A per variable summary of whether or not a statistically significant difference was found and respective effect size, can be seen on Table 4.10.

Of all three age groups considered, 'Young' (16 to 25 years old) differed the most from the other two groups. For the 12 statistically significant mean differences found across age groups, 'Young' scored either significantly higher or lower than the other two groups, whilst these did not significantly differ from each other most of the time. Participants within the 'Young' group scored higher in hypomanic traits, well being and both internal and external functional emotion regulation strategies. Contrary to this, they scored the lowest for depression, perceived conflict, autonomous and avoidant attachment styles, negative beliefs about worry, lack of cognitive confidence and external dysfunctional emotion regulation strategies. Interestingly scores for activation, anxious attachment, overall metacognition, positive beliefs about worry, need to control thoughts, cognitive self consciousness, internal dysfunctional emotion regulation strategies and reflective functioning did not differ across age range.

Regarding gender, 11 out of the 20 comparisons that were carried out, reached statistical significance. Females scored significantly higher in depression, autonomous and anxious attachment styles, negative beliefs about worry, external functional regulation of emotion strategy and reflective functioning. On the other hand, males scored significantly higher in need to control thoughts, cognitive self-consciousness, internal functional emotion regulation strategies and perceived well being. Consequently, no differences were found in mean scores of hypomanic traits, activation levels, perceived conflict, avoidant attachment, overall metacognition, positive beliefs about worry, cognitive confidence levels and both internal and external dysfunctional emotion regulation strategies.

Lastly, regarding diagnosis, statistically significant differences were found across diagnostic groups for all the measured variables. The majority of these differences had an effect of moderate or large size.

Moreover, the data suggests that having a bipolar disorder diagnosis appears to imply a larger degree of disadvantage, when compared to either another mental health diagnosis or no diagnosis at all. The ‘BD Diagnosis’ group scored the highest for hypomania, depression, activation, perceived conflict, insecure attachment, negative metacognition, and dysfunctional emotion regulation strategies. Interestingly, the ‘BD Diagnosis’ group also had the highest reflective functioning (RF) scores, yet the lowest mean scores for perceived well being, and both internal and external functional emotion regulation strategies. However, for these last three variables, no statistically significant differences were found between ‘BD Diagnosis’ and ‘Other Diagnosis’ groups, whilst the ‘No Diagnosis’ group had significantly higher mean scores, suggesting that poor mental health in general and not BD in particular, are linked to decreased well being and a lack of use of functional strategies to regulate emotions.

Finally, it is interesting to note that there were four comparisons in which the ‘Other Diagnosis’ and the ‘No Diagnosis’ groups did not significantly differed in mean scores, emphasizing the relevance of having a bipolar disorder diagnosis. These comparisons involved mean scores for hypomanic traits, activation index, positive beliefs about worry and RF.

Table 4.10 Statistically significant mean differences and effect size by group

Measured variable	Grouping variable					
	Age range		Gender		Diagnosis status	
	Sig difference	Effect size	Sig difference	Effect size	Sig difference	Effect size
HPS*	✓	.01	×	.001	✓	.10
ISS-DI*	✓	.01	✓	.002	✓	.13
ISS-WB*	✓	.01	✓	.002	✓	.07
ISS-AI*	×	.001	×	.0005	✓	.04
ISS-PC*	✓	.003	×	.001	✓	.09
RSQ-AT*	✓	.02	✓	.01	✓	.03
RSQ-AX*	×	.001	✓	.009	✓	.08
RSQ-AV*	✓	.02	×	.0002	✓	.06
BDI-II*	✓	.03	✓	.008	✓	.27
MCQ-TOT*	×	.001	×	.00006	✓	.12
MCQ-PB*	×	.001	×	.00005	✓	.01
MCQ-NB*	✓	.006	✓	.008	✓	.15
MCQ-CC*	✓	.02	×	.00001	✓	.12
MCQ-NCT*	×	.002	✓	.003	✓	.06
MCQ-CSC*	×	.001	✓	.007	✓	.02
ERQ-ID*	×	.005	×	.0001	✓	.15
ERQ-IF*	✓	.01	✓	.002	✓	.03
ERQ-ED*	✓	.005	×	.00004	✓	.08
ERQ-EF*	✓	.02	✓	.005	✓	.03
RF*	×	.001	✓	.01	✓	.01

✓ There was a significant difference found in the mean scores across groups at $p < .05$

× There was no significant difference found in the mean scores across groups

* HPS= Hypomanic Personality Scale / ISS-DI= Depression Index / ISS-WB= Well-being / ISS-AI= Activation Index / ISS-PC= Perceived Conflict / RSQ-AT= Autonomous Insecure Attachment / RSQ-AX= Anxious Insecure Attachment / RSQ-AV= Avoidant Insecure Attachment / BDI-II= Depression / MCQ-TOT= Total metacognition score / MCQ-PB= Positive Beliefs About Worry / MCQ-NB= Negative Beliefs About Worry / MCQ-CC= Cognitive Confidence / MCQ-NCT= Need to Control Thoughts / MCQ-CSC= Cognitive Self-Consciousness / ERQ-ID= Internal Dysfunctional Emotion Regulation / ERQ-IF= Internal Functional Emotion Regulation / ERQ-ED= External Dysfunctional Emotion Regulation / ERQ-EF= External Functional Emotion Regulation / RF= Reflective Functioning

Bonferroni Correction

Given that multiple comparisons may increase Type 1 error Bonferroni's correction was applied and an adjusted p value calculated. In total, 60 comparisons were made, thus the standard 0.05 significance p value was divided by 60, resulting in an adjusted value of $p < 0.00083$ as the new significance level.

Using this significance level, 90% of the comparisons remained the same. Only 6 comparisons no longer reached this more stringent significance level (see Table 4.11).

Two comparisons across age were no longer significant. Perceived conflict (which is an overall psychopathology index) was only significant at $p < .01$ level and external dysfunctional emotion regulation was significant at $p < .001$.

The biggest change was across gender comparisons with four previously found differences not being significant anymore. Depression (measured by the depression index), well being and the internal functional emotion regulation subscale were only significant at $p < .05$ level, whilst differences in 'the need to control thoughts' metacognition subscale were previously significant at the level of $p < .01$.

It is worth noting that all the comparisons across diagnosis groups stayed the same even after significance level correction, thus being all significant at $p < .00083$.

Table 4.11 Statistically significant mean differences and effect size after Bonferroni's correction

Measured variable	Grouping variable					
	Age range		Gender		Diagnosis status	
	Sig difference	Effect size	Sig difference	Effect size	Sig difference	Effect size
HPS*	✓	.01	×	.001	✓	.10
ISS-DI*	✓	.01	×	.002	✓	.13
ISS-WB*	✓	.01	×	.002	✓	.07
ISS-AI*	×	.001	×	.0005	✓	.04
ISS-PC*	×	.003	×	.001	✓	.09
RSQ-AT*	✓	.02	✓	.01	✓	.03
RSQ-AX*	×	.001	✓	.009	✓	.08
RSQ-AV*	✓	.02	×	.0002	✓	.06
BDI-II*	✓	.03	✓	.008	✓	.27
MCQ-TOT*	×	.001	×	.00006	✓	.12
MCQ-PB*	×	.001	×	.00005	✓	.01
MCQ-NB*	✓	.006	✓	.008	✓	.15
MCQ-CC*	✓	.02	×	.00001	✓	.12
MCQ-NCT*	×	.002	×	.003	✓	.06
MCQ-CSC*	×	.001	✓	.007	✓	.02
ERQ-ID*	×	.005	×	.0001	✓	.15
ERQ-IF*	✓	.01	×	.002	✓	.03
ERQ-ED*	×	.005	×	.00004	✓	.08
ERQ-EF*	✓	.02	✓	.005	✓	.03
RF*	×	.001	✓	.01	✓	.01

✓ There was a significant difference found in the mean scores across groups at $p < .00083$

×

×

* HPS= Hypomanic Personality Scale / ISS-DI= Depression Index / ISS-WB= Well-being / ISS-AI= Activation Index / ISS-PC= Perceived Conflict / RSQ-AT= Autonomous Insecure Attachment / RSQ-AX= Anxious Insecure Attachment / RSQ-AV= Avoidant Insecure Attachment / BDI-II= Depression / MCQ-TOT= Total metacognition score / MCQ-PB= Positive Beliefs About Worry / MCQ-NB= Negative Beliefs About Worry / MCQ-CC= Cognitive Confidence / MCQ-NCT= Need to Control Thoughts / MCQ-CSC= Cognitive Self-Consciousness / ERQ-ID= Internal Dysfunctional Emotion Regulation / ERQ-IF= Internal Functional Emotion Regulation / ERQ-ED= External Dysfunctional Emotion Regulation / ERQ-EF= External Functional Emotion Regulation / RF= Reflective Functioning

4.3 Structural Equation Modelling analysis (SEM)

4.3.1 Overview

Structural Equation Modelling was used to test the hypotheses postulated for this study. SEM is a powerful method of data analysis that combines aspects of factor analysis and multiple regression, allowing researchers to reduce the many measured variables into fewer latent variables. Therefore, it allows for complex relationships to be explored. Hypothesis regarding how theoretical concepts relate, along with the directionality and statistical significance of these relationships can be tested with SEM (Schreiber et al., 2006).

Mplus was the software of choice to perform this analysis. Given that all along SEM was planned as the statistical technique that was going to be used to analyse the collected data, a priori sample size calculations were done. Based on the results of optimal sample size, recruitment was carried out and data was gathered. Therefore, there is sufficient confidence in that the size of the sample was satisfactory and fulfilled the rule of thumb that indicates the need of at least 10 participants per estimated parameter. Regarding missing data, this did not pose a problem in this study either, given that only 100 cases with incomplete data were included in the analysis. This small proportion of participants corresponds to those who failed to answer the RF questions, thus had no overall score indicative of their reflective capacities. However this fact is trivial given that the data was missing at random and did not exceed 5% of the data points constituting the overall sample (Tabachnick &

Fidell, 2007). Concerning normality of the data, although tests yielded mixed results that indicated in some cases violation of this assumption, by choosing ML estimator the likelihood of accepting incorrect models or render inaccurate parameter estimates diminishes.

Another important aspect to consider is model fit. To assess the fit of a one-time analysis model, it is suggested to look at five main indicators. These are the Chi Square, CFI, TLI, RMSEA and SRMR. The cut off values proposed for identifying good fit for continuous data are $CFI > .95$, $TLI > .95$, $RMSEA < .06$ and $SRMR < .08$ whilst Chi Square should be non-significant (Schreiber et al., 2006). Lastly, there are two main steps to be followed when performing SEM. Firstly, confirmatory factor analysis (CFA) to make sure the latent variables are being measured accurately, must be carried out. Secondly the structural aspect of the analysis is introduced, when directionality is specified with regards to the existing inter-relations between the latent variables (Schreiber et al., 2006). These relationships are often described in the stated hypothesis. For this study only CFI, TLI and RMSEA fit indices will be reported, given that the items of the HPS are considered categorical variables in Mplus due them being dichotomous. When categorical variables are specified the estimator changes from ML to WLSMV and no value for the SRMR index is given in the output. Note that Chi Square is reported but should not be taken as an indicator of goodness of fit because it is not a reliable indicator when used in a large sample. The available literature suggests that Chi Square is sensitive to sample size and it is not unusual for this indicator to be statistically significant with robust samples (Byrne, 2012).

4.3.2 The measurement model (CFA)

Initially, a measurement model of all latent variables was tested, but it did not converge. Therefore each latent variable's measurement model was individually assessed, leading to the removal of some items of the Relationship Scale Questionnaire (RSQ) subscales (Autonomous, Anxious and Avoidant) and the Hypomanic Personality Scale (HPS). The items were deleted due to their corresponding loadings being lower than 0.3. From the RSQ subscales items 2, 6, 9, 10 and 13 were dropped whilst from the HPS items 1, 2, 8, 11 and 20 were dropped. Given that factor analysis had already been carried out for the RSQ, no further changes were made to the scale. Factor determinacy of the subscales after item deletion was confirmed in Mplus, with all dimensions indicating high determinacy (>0.87). In the case of the HPS, the remaining 15 items were subjected to principal axis factor analysis with Promax rotation in Mplus, to confirm the one-dimensionality of the scale. The results, however, did not confirm a one-dimensional structure but pointed at two underlying factors constituting the scale. The results of the oblique rotation are shown in Table 4.12. The two identified dimensions were distinct from each other not just in terms of the theme characterizing the questions constituting each factor, but also in terms of relative symptom severity being measured. According to Meads and Bentall (2008), the analysis they performed to reduce the original HPS to the 20-item version used in this study, made it possible for them to identify the relative severity of hypomania that each item was indicative of. Based on this, further consideration of the factor analysis results was done, leading to the conclusion that one of the identified dimensions was largely

constituted by items classified as low in terms of symptom severity, whilst the other one was mainly comprised by items considered high (see Table 4.13). This suggests the underlying factors of the HPS, emerged as a consequence of relative symptom severity being measured, and therefore were named ‘High Hypomania (HH)’ and ‘Low Hypomania (LH)’. Additionally, factor HH appears to be mainly characterized by questions about increased energy levels, whilst items about affective related issues predominate in the LH dimension. The identified dimensions’ factor determinacy was also assessed with Mplus, with results indicating that both HH and LH had a high factor determinacy (>0.88).

Table 4.12 Oblique Rotation Solution for the HPS

Pattern Matrix			
Item		Factor	
		1	2
3	Sometimes ideas and insights come to me so fast that I cannot express them all		.669
4	I seem to be a person whose mood goes up and down easily	.664	
5	There are often times when I am so restless that it is impossible for me to sit still	.697	.326
6	I often feel excited and happy for no apparent reason.		.672
7	I often have moods where I feel so energetic and optimistic that I feel I could outperform almost anyone at anything		.706
9	I am frequently in such high spirits that I can't concentrate on any one thing for too long		.711
10	I very frequently get into moods where I wish I could be everywhere and do everything at once		.678
12	I am so good at controlling others that sometimes it scares me		.387
13	I am usually in an average sort of mood, not too high and not too low	-.571	
14	I do most of my best work during brief periods of intense inspiration		.509
15	I am considered to be a kind of "hyper" person		.575
16	Many people would consider me to be amusing but kind of eccentric		.514
17	I have often felt happy and irritable at the same time	.727	
18	I frequently find that my thoughts are racing	.776	
19	When I feel an emotion, I usually feel it with extreme intensity	.715	

Table 4.13 Final Solution for the HPS

Factor	Items
Low Hypomania (LH)	I seem to be a person whose mood goes up and down easily There are often times when I am so restless that it is impossible for me to sit still I am usually in an average sort of mood, not too high and not too low * I have often felt happy and irritable at the same time I frequently find that my thoughts are racing When I feel an emotion, I usually feel it with extreme intensity
High Hypomania (HH)	Sometimes ideas and insights come to me so fast that I cannot express them all I often feel excited and happy for no apparent reason I often have moods where I feel so energetic and optimistic that I feel I could outperform almost anyone at anything I am frequently in such high spirits that I can't concentrate on any one thing for too long I very frequently get into moods where I wish I could be everywhere and do everything at once I am so good at controlling others that sometimes it scares me I do most of my best work during brief periods of intense inspiration I am considered to be a kind of "hyper" person Many people would consider me to be amusing but kind of eccentric

*Item loaded negatively into its respective factor

4.3.3 Overall fit of the measurement model (CFA)

Once the changes described above were made to the RSQ and HPS, the measurement model was tested again. This time the confirmatory factor analysis (CFA) based on data from 2325 participants showed a moderate fit $\chi^2(6027) = 26742$, $p < 0.001$, $CFI = 0.84$, $TLI = 0.83$, $RMSEA = 0.03$. Moreover, the loadings of each measured variable (112) onto its corresponding latent variable (19) were all greater than 0.3 and significant at the level of $p < 0.001$. However, as the model showed just a modest fit and based on the interpretation of the output, the decision was made to simplify and reduce the model from 19 to 18 latent variables. This smaller measurement model was specified as a second order factor analysis and included the High and Low Hypomania factors as measures of bipolar proneness, the three distinct types of attachment as measures of insecure attachment, well being and depression indices,

the five metacognition subscales as measures of negative metacognitive beliefs and both internal and external dysfunctional emotion regulations dimensions as measures of dysfunctional emotion regulation. The functional emotion regulation subscales were left out given that they were not hypothesized about. Only one measure of depression was necessary and thus the latent variable Depression as measured by the BDI-II was not used. Lastly, the activation and perceived conflict indices seemed redundant to hypomania and depression measures, thus were also left out of the measurement model. This model was tested and fitted the data more accurately $\chi^2(1597) = 7921, p < 0.001, CFI = 0.89, TLI = 0.89, RMSEA = 0.04$, but not quite as good as it would be expected. Therefore, the decision was made to further simplify the model and reduce the number of latent variables based on both the literature and interpretation of the output. Where there were multiple latent variables representing the same theoretical construct, the variable that contributed more and thus had the highest regression coefficient was selected. Correlation coefficients and individual item loadings were also considered to ensure selection of the best latent variables to represent the key concepts of interest to this study. This led to a reduction in the number of latent variables from 18 to 6. These latent variables represent the concepts of severe bipolar proneness, anxious insecure attachment, internal dysfunctional emotion regulation, negative metacognitive beliefs around the need to control one's thoughts, depressive symptoms and well being. Additionally the RF score was included in this final stage of the measurement model specification. The model showed a very good fit to the available data $\chi^2(414) = 2870, p < 0.001, CFI = 0.97, TLI = 0.96, RMSEA = 0.05$, thus it was used in the following phase of hypothesis testing through structural equation modeling.

4.3.4 Hypotheses testing with SEM

Research questions:

- Does attachment directly predict reflective functioning and emotion regulation?
- Does reflective functioning mediate the relationship between attachment and emotion regulation?
- Does reflective functioning predict emotion regulation?
- Does emotion regulation directly predict proneness to bipolar disorder?
- Do attachment and reflective functioning indirectly predict proneness to bipolar disorder?
- Do depression and negative metacognitions associate with increased likelihood of developing bipolar disorder?

Hypotheses:

- Insecure attachment will directly predict both dysfunctional emotion regulation and reflective functioning.
- Insecure attachment will indirectly predict bipolar proneness through dysfunctional emotion regulation.
- Reflective functioning will mediate the relationship between insecure attachment and dysfunctional emotion regulation.
- Reflective functioning will indirectly predict proneness to bipolar disorder through dysfunctional emotion regulation.
- Dysfunctional emotion regulation will directly predict proneness to bipolar

disorder, depressive symptoms and negative metacognitions.

- Depressive symptoms and negative metacognitions will directly predict proneness to bipolar disorder.

4.3.4.1 Model 1

An initial model built to test the hypothesized relationships between the developmental constructs and mood instability showed a good fit to the data $\chi^2(204) = 972, p < 0.001, CFI = 0.97, TLI = 0.97, RMSEA = 0.04$ (see Figure 4.1). This model suggests that as hypothesized and in concordance with the literature, insecure attachment predicts dysfunctional emotion regulation whilst the latter predicts depressive symptoms and proneness to bipolar disorder. However, contrary to what was expected, dysfunctional emotion regulation negatively predicted proneness to bipolar disorder. The indirect effect of insecure attachment through dysfunctional emotion regulation, on both depression ($\beta = .54, p = .000$) and bipolar proneness ($\beta = -.31, p = .000$) was significant at the level of $p < 0.001$. Nonetheless, indirect paths going from attachment to emotion regulation, hypomania and depression through RF were not significant, stressing the impact of the direct relationship between attachment and emotion regulation. Lastly, significant indirect paths ($p < .01$) starting from RF to both depression ($\beta = -.044, p = .002$) and hypomania ($\beta = .025, p = .002$) were also identified. These last two paths suggested that as RF lessens the likelihood of hypomania decreases, whilst the probabilities of depression increase.

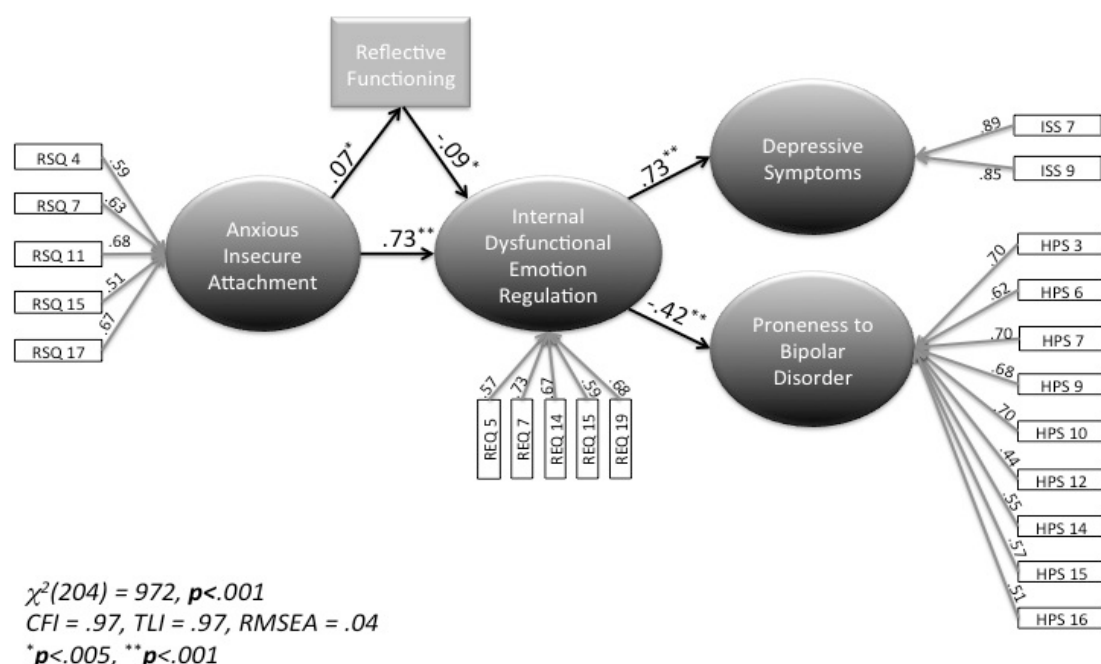


Figure 4.1 Structural equation model of developmental aspects as predictors of low and high mood

4.3.4.2 Model 2

To further understand why dysfunctional emotion regulation negatively predicts proneness to bipolar, a second model was tested, this time integrating the Well Being latent variable.

The model was tested and showed a slightly less good fit to the data, but still a good fit $\chi^2(269) = 1316, p < 0.001, CFI = 0.94, TLI = 0.93, RMSEA = 0.04$ (see Figure 4.2). This model's noteworthy indirect paths were significant at $p < 0.001$. Similarly to Model 1, the effect of insecure attachment on bipolar proneness through dysfunctional emotion regulation was negative ($\beta = -.42, p = .000$), whilst the effect of insecure attachment on bipolar proneness through dysfunctional emotion regulation, depression and well being was positive ($\beta = .13, p = .000$) suggesting that indeed

insecure attachment can be a risk factor for bipolar disorder, when perceived well being is affected by depressive symptoms that have arisen from internal dysfunctional emotion regulation and insecure attachment ($\beta=.51$, $p=.000$). This is further confirmed by results of the indirect path going from insecure attachment to well being proving to be significant ($\beta=-.37$, $p=.000$). Without the presence of depression, hypomania is still negatively predicted by dysfunctional emotion regulation.

Lastly, consistent with the first model, all indirect effects going from insecure attachment through RF were not statistically significant. However, in addition to the paths identified in model 1, this model contained two more significant indirect paths ($p<.05$) starting from RF. These were the path going from RF to bipolar proneness, through emotion dysregulation, depression and well being ($\beta=-.008$, $p=.02$), and the path going from RF to well being ($\beta=.023$, $p=.02$). This suggests that increased RF predicts more well being and less likelihood of developing bipolar disorder in the presence of depression and impaired well being. However, in spite of RF indirect paths being statistically significant, results indicate that insecure attachment is of greater importance since it is a stronger predictor of mood instability given its direct impact on emotion regulation.

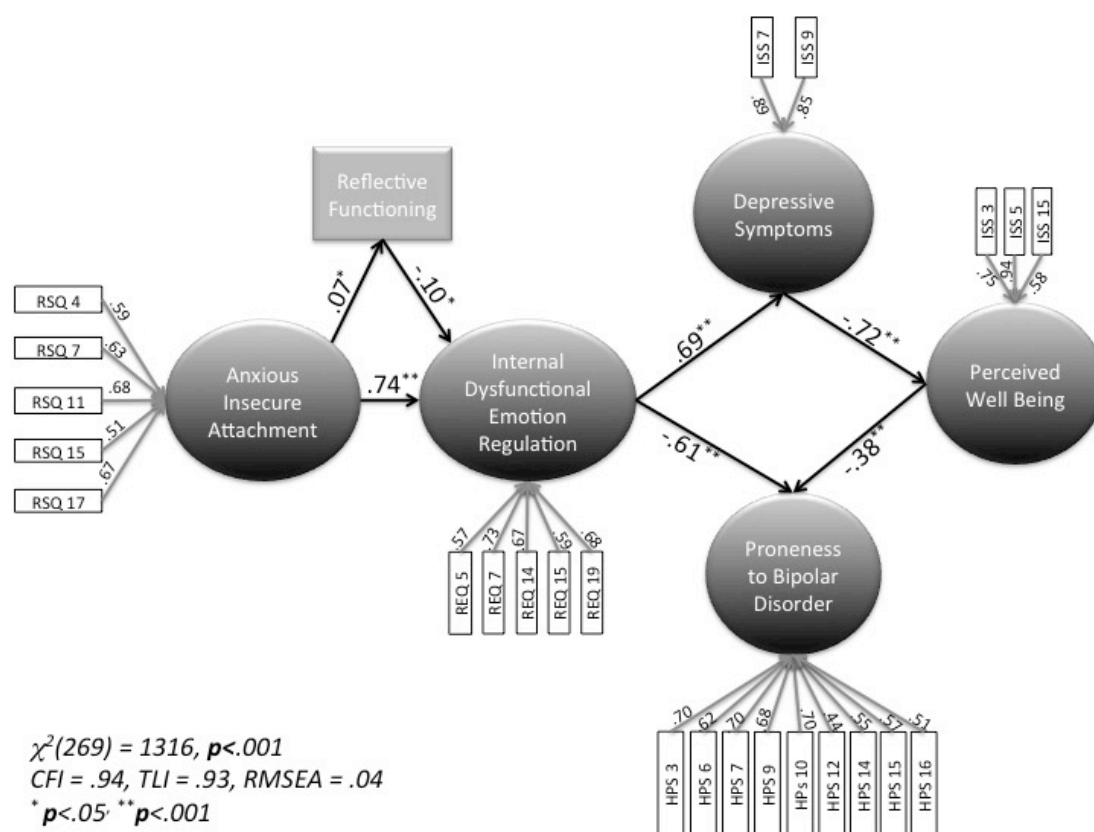


Figure 4.2 Structural equation model of developmental aspects as predictors of low and high mood, and well being

4.3.4.3 Model 3

Based on all stated hypothesis, a third model was built and it showed a good fit to the data $\chi^2(343) = 1443, p < 0.001, CFI = 0.96, TLI = 0.95, RMSEA = 0.03$ (see Figure 4.3). In line with what was expected, insecure attachment strongly predicted dysfunctional emotion regulation, but contrary to theory it did not strongly predict reflective functioning. Similarly, reflective functioning is not a strong predictor of dysfunctional emotion regulation, even though all relationships are statistically significant. As hypothesized, dysfunctional emotion regulation is a strong predictor of negative metacognitions (the need to control one's thoughts), depression and hypomania, whilst the latter is also being predicted by depression and negative

beliefs about cognitive control. The indirect paths starting at insecure attachment and involving RF in this model, were all significant at the level of $p < .05$. However, the standardized indirect coefficients were very small with the largest accounting for the effect of insecure attachment on internal dysfunctional emotion regulation ($-\beta = 0.005$, $p = .03$), and the lowest reflecting the effect of insecure attachment on bipolar proneness going through RF, dysfunctional emotion regulation, negative metacognitions ($\beta = 0.001$, $p = .04$) and depression ($\beta = -0.001$, $p = .04$). However, as shown in the previous two models, when indirect RF paths do not involve anxious attachment, RF's predictive capacity seems to improve. In this model statistically significant ($p < .01$) indirect paths originating from RF and terminating at bipolar proneness, going through depression ($\beta = -.013$, $p = .002$) and negative metacognitions ($\beta = .015$, $p = .002$), were identified. Also, the indirect path from RF to negative metacognitions was significant at $p < .001$ ($\beta = -.054$, $p = .000$), indicating that increased RF diminishes the extent to which a person experiences negative metacognitions. Moreover, insecure attachment influenced depression ($\beta = -0.004$, $p = .04$), BD proneness ($\beta = 0.002$, $p = .04$), and metacognition ($\beta = -0.004$, $p = .04$) through RF and emotion dysregulation too. On the other hand, the other five indirect effects seemed more meaningful and reached statistical significance at $p < .001$. The three paths from insecure attachment to bipolar proneness going through negative metacognition ($\beta = -.15$, $p = .000$), depression ($\beta = .13$, $p = .000$) and directly from internal dysfunctional emotion regulation ($\beta = -.29$, $p = .000$) were all significant. The new path going from attachment to BD via negative metacognitions had a negative indirect coefficient, suggesting that whilst more insecure attachment leads to increased dysfunctional emotion regulation, when the latter leads to the need to control one's thoughts, the

likelihood of hypomania decreases. Lastly, in this model insecure attachment strongly predicted both depression ($\beta=.53$, $p=.000$) and negative metacognitive beliefs about control ($\beta=.55$, $p=.000$), through dysfunctional emotion regulation, with both indirect coefficients being statistically significant at $p<.001$.

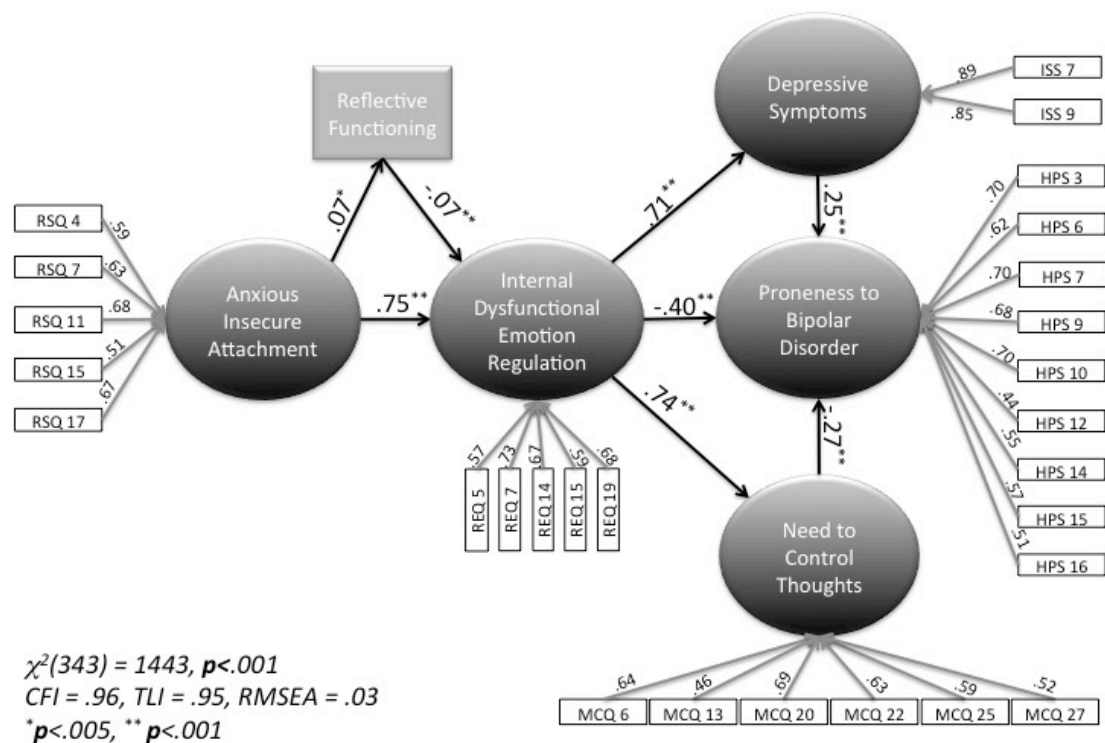


Figure 4.3 Structural equation model of developmental aspects as predictors of low and high mood, and negative metacognitive beliefs around the need to control one's thoughts.

4.3.4.4 Model 4

Lastly, to integrate all previous models a final model was tested with all 6 latent variables: insecure attachment, dysfunctional emotion regulation, proneness to bipolar disorder, depression, well being and need to control thoughts. This model was well fitted to the data $\chi^2(427) = 3005$, $p<0.001$, $CFI = 0.97$, $TLI = 0.96$, $RMSEA$

= 0.05 (see Figure 4.4). In this model the direct link from dysfunctional emotion regulation to hypomania was removed to assess the meditational effects within the model, whilst well being was reintroduced as a predictor of bipolar proneness. These changes meant a slight improvement to the fit, when compared to the same model with the direct link between internal dysfunctional emotion regulation and bipolar disorder proneness ($\chi^2(426) = 1964, p < 0.001, CFI = 0.93, TLI = 0.92, RMSEA = 0.04$), supporting the notion of a fully mediated model. Based on this model, it seems like the data backs up the idea of bipolar proneness being predicted by a lack of well being and a decreased need to control ones' thoughts. Indirect paths in this model were all significant. The six paths going through RF were significant at the level of $p < .05$, whilst the remaining five paths reached statistical significance at $p < .001$. Similarly to the previous model's results, the indirect coefficients of those paths starting from attachment but involving RF were rather small ranging between ($\beta = -0.005$ to $\beta = 0.003$). As in the previous models, the indirect paths originating from RF were more meaningful with an additional statistically significant ($p < .001$) indirect path going from RF to bipolar proneness through negative metacognitions being identified ($\beta = -.009, p = .000$). The indirect effect of insecure attachment on depression and negative metacognitions remained strong with coefficients of $\beta = .48$ and $\beta = .61$ respectively. Also in compliance with the literature, insecure attachment had a substantial negative indirect effect on well being, with the standardized indirect coefficient being $\beta = -.34$. In this model the indirect effect of attachment on hypomania, through dysfunctional emotion regulation and negative metacognitions increased ($\beta = -.38$) whilst the effect of attachment on bipolar proneness going through emotion regulation, depression and well being decreased ($\beta = .09$) in

comparison to what it was in Model 2.

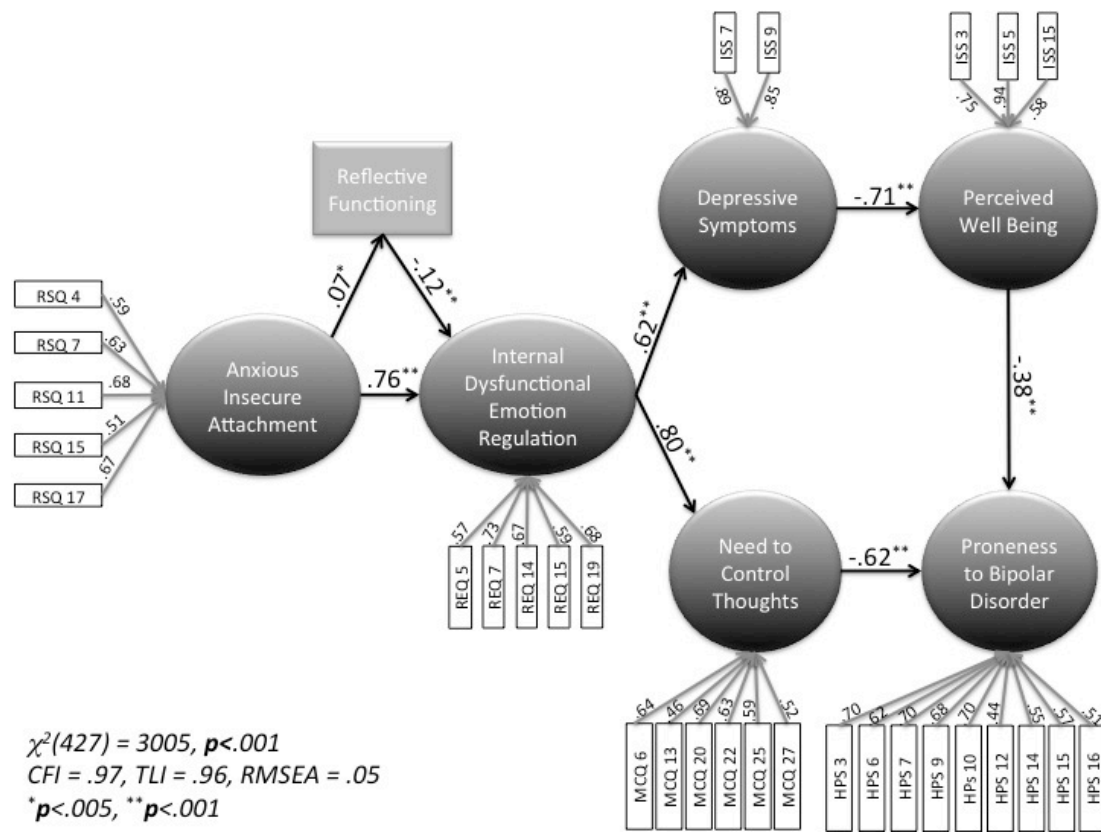


Figure 4.4 Structural equation model of developmental aspects as predictors of low and high mood, well being and negative metacognitive beliefs around the need to control one's thoughts.

Further exploration of the data led to testing Model 4 across groups defined by gender, age and diagnosis status (Dx). These groups were defined in the same way as the ones used for mean comparisons. Using the multigroup modelling approach groups were compared on bipolar risk and associated predictive factors. The Chi-square from a model with all parameters allowed to be different between groups was compared to the Chi-square from a model with relationships constrained to be equal across groups. In all three cases, by gender, age and diagnosis, the model with all parameters allowed to be different fit the data better as supported by higher CFI and lower RMSEA, SRMR and Chi-square (see Table 4.14). These results indicate that

bipolar risk does not manifest equally across groups, in terms of the strength of the relationships amongst measured variables and specified structural relationships. There are sufficient differences in one or more of the specified relationships across groups and therefore, it can be concluded that gender, age and diagnosis status have an impact on likelihood of developing bipolar disorder.

The model with all parameters freely estimated in the two gender groups, fit the data moderately well ($CFI = 0.91$, $TLI = 0.91$, $RMSEA = 0.04$, $SRMR = 0.05$), whilst the model with parameters constrained to be equal across males and females did not fit the data ($CFI = 0.54$, $TLI = 0.52$, $RMSEA = 0.09$, $SRMR = 0.35$). Similarly, the model with all parameters freely estimated in the three age groups, fit the data reasonably well ($CFI = 0.91$, $TLI = 0.91$, $RMSEA = 0.04$, $SRMR = 0.04$), whilst the model with parameters constrained to be equal had a significantly poorer fit ($CFI = 0.82$, $TLI = 0.80$, $RMSEA = 0.06$, $SRMR = 0.07$). Lastly, the model with all parameters freely estimated in the three diagnostic status groups, fit the data moderately well ($CFI = 0.90$, $TLI = 0.89$, $RMSEA = 0.04$, $SRMR = 0.05$), whilst the model with parameters constrained to be equal across diagnostic status groups did not seem to fit the data equally well ($CFI = 0.79$, $TLI = 0.78$, $RMSEA = 0.06$, $SRMR = 0.07$). Graphical representation of the multigroup analysis facilitates locating where the main differences exist (see Figures 4.5 to 4.7). However this visual representation is merely informative, and caution may be warranted when interpreting these results.

Table 4.14 Chi-Square comparisons of the multigroup SEM analysis

	χ^2	df	$\Delta\chi^2$	Δdf
Gender				
All parameters free	2705.07	902		
Parameters equal	9115.85	898	6410.78 ^a	4
Age				
All parameters free	3332.27	1377		
Parameters equal	4916.51	1300	1584.24 ^a	77
Diagnosis				
All parameters free	3423.67	1377		
Parameters equal	4950.32	1300	1526.65 ^a	77

^a $p < .001$

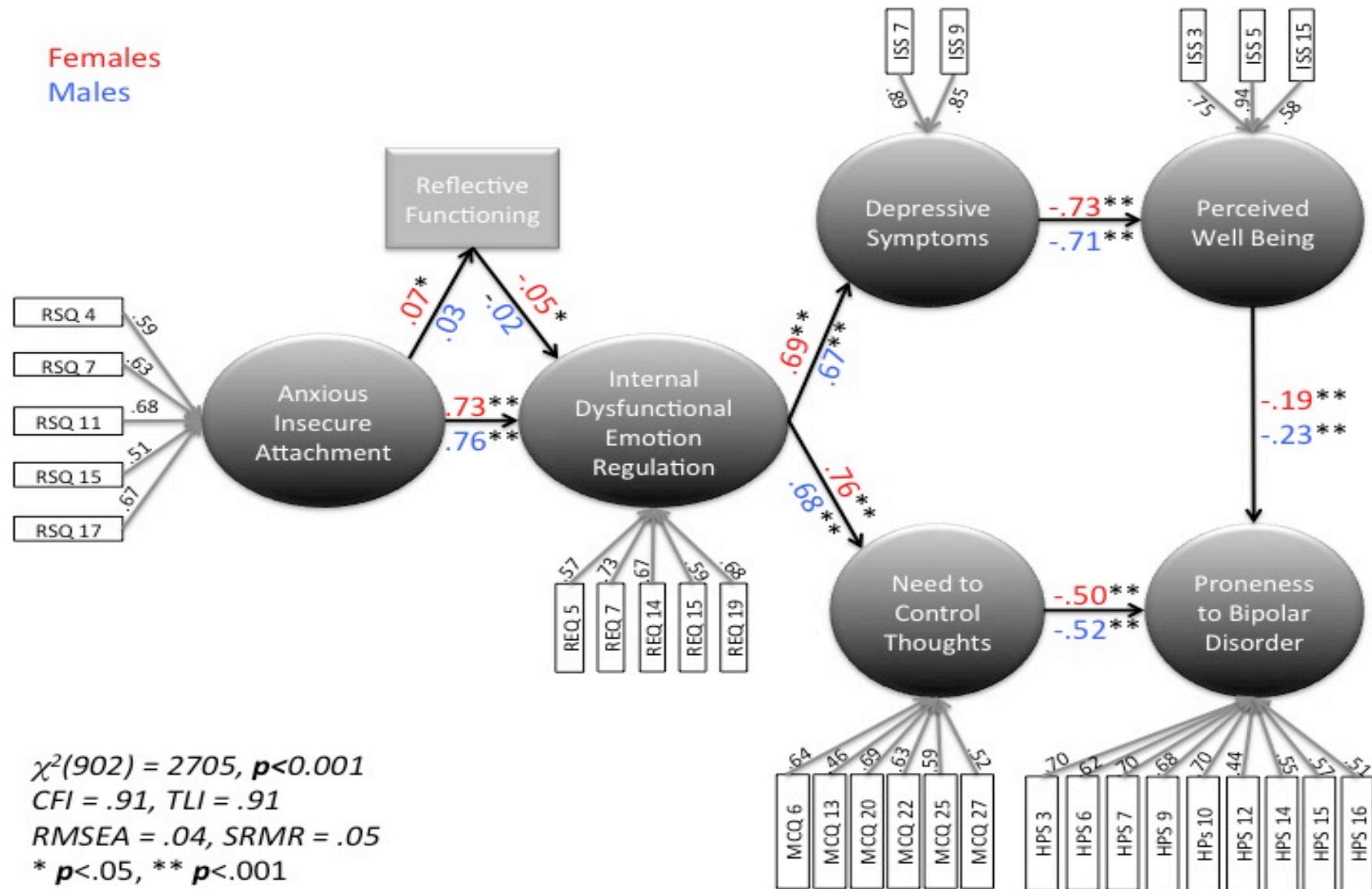


Figure 4.5 Structural equation model of bipolar risk in males and females

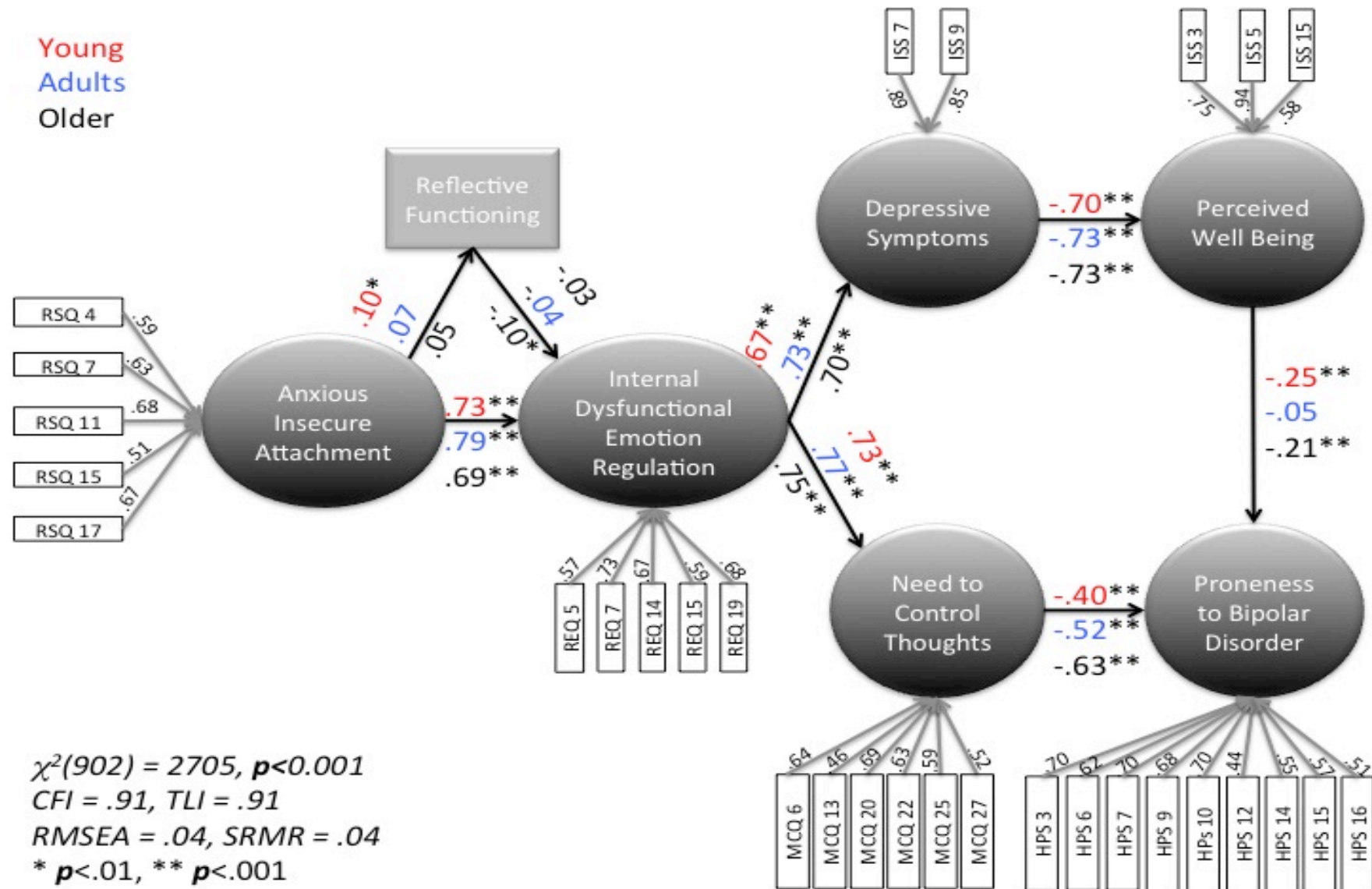


Figure 4.6 Structural equation model of bipolar risk in three age groups

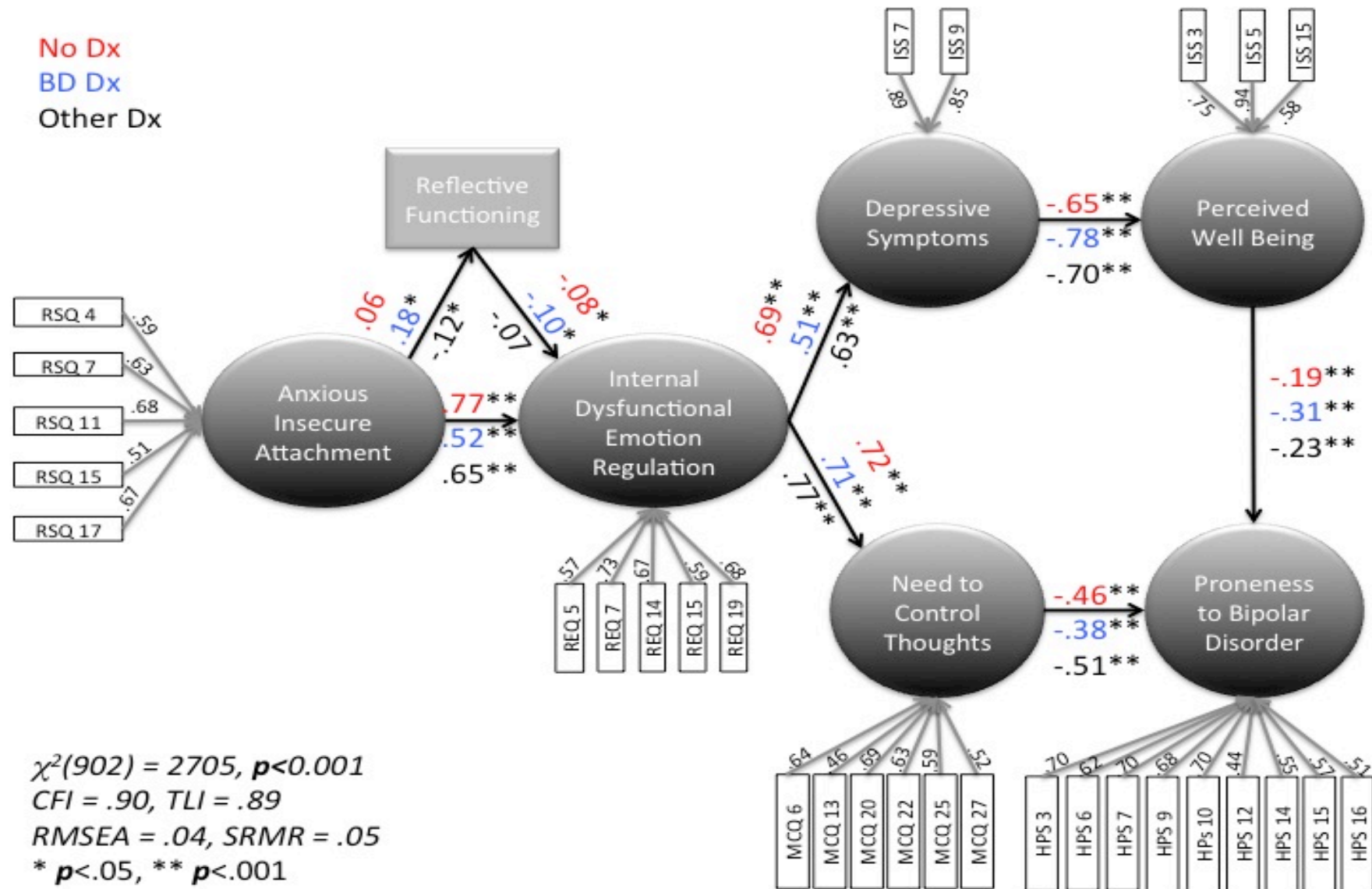


Figure 4.7 Structural equation model of bipolar risk in three diagnostic status derived groups

Given what is known about age of onset for bipolar disorder (Bechdolf et al., 2010), it not surprising that age was a meaningful dependent variable in this study since the vast majority of the sample was under 35 years of age. It was not unexpected either that gender had an impact on what is effectively a model of attachment and its association with mood instability given what is known about depression and its preponderance amongst females (Piccinelli & Wilkinson, 2000) which constituted the majority of this sample. Lastly, the differences found between the groups derived based on diagnosis status, seem consistent with what was expected given the nature of the dependent variable itself. Comparing people with no mental health diagnosis to those holding a bipolar disorder or other mental health diagnosis seems unlikely to support the notion of invariance across groups.

It is also interesting to look at the indirect effects that differed across groups (see Tables 4.15 - 4.17). Note that all other indirect effects, that are not included in the tables, were substantially similar across groups in terms of statistical significance, as well as comparable in relative strength of the relationship. As one can appreciate in tables 4.15 to 4.17 the main differences across all groups were in those paths initiating from reflective functioning, hinting at an important difference in this capacity across gender, age and diagnosis status. Particularly interesting is the difference between groups by diagnosis. Notice that all paths originating from RF are statistically significant in the group with no diagnosis, whereas in the other groups they are not. Perhaps the effect of diagnosis is somewhat associated to impaired reflectiveness, making those paths not significant.

Table 4.15 Indirect effects that are different across gender

	Females		Males	
	β	$p < .05$	β	$p > .05$
RF – DysfER – METACOG – BD	.017	.039	.007	.663
RF – DysfER – DEP – WB – BD	-.004	.048	-.002	.665
RF – DysfER – DEP – WB	.022	.038	.009	.663
RF – DysfER – DEP	-.031	.038	-.013	.663
RF – DysfER – METACOG	-.034	.038	-.014	.663

RF=Reflective Functioning / DysfER=Dysfunctional Emotion Regulation / METACOG=Metacognition / BD= Prone to Bipolar Disorder / DEP= Depression / WB= Well-Being

Table 4.16 Indirect effects that are different across age groups

	Young		Adults		Older	
	β	p	β	$p > .05$	β	$p < .05$
Att – DysfER – DEP – WB – BD	.090	.000	.020	.333	.071	.000
RF – DysfER – METACOG – BD	.007	.374	.016	.273	.050	.009
RF – DysfER – DEP – WB – BD	-.003	.377	-.001	.468	-.011	.023
DysfER – DEP – WB – BD	.121	.000	.024	.333	.105	.000
RF – DysfER – DEP – WB	.012	.372	.021	.271	.051	.008
RF – DysfER – DEP	-.017	.372	-.029	.271	-.071	.008
RF – DysfER – METACOG	-.019	.372	-.030	.271	-.075	.008

Att= Anxious Insecure Attachment / RF=Reflective Functioning / DysfER=Dysfunctional Emotion Regulation / METACOG=Metacognition / BD= Prone to Bipolar Disorder / DEP= Depression / WB= Well-Being

Table 4.17 Indirect effects that are different across diagnosis groups

	No Dx		BD Dx		Other Dx	
	β	$p < .05$	β	$p > .05$	β	$p > .05$
RF – DysfER – METACOG – BD	.025	.004	.026	.069	.028	.107
RF – DysfER – DEP – WB – BD	-.006	.010	-.012	.078	-.007	.130
RF – DysfER – DEP – WB	.032	.004	.038	.062	.032	.103
RF – DysfER – DEP	-.049	.003	-.050	.061	-.045	.120
RF – DysfER – METACOG	-.054	.003	-.068	.058	-.055	.102

RF=Reflective Functioning / DysfER=Dysfunctional Emotion Regulation / METACOG=Metacognition / BD= Prone to Bipolar Disorder / DEP= Depression / WB= Well-Being

4.4 Cluster and Discriminant Analysis

Discriminant analysis was performed in SPSS to substantiate the findings previously described. This approach is commonly used to identify an optimal subset of variables that is capable of distinguishing among discrete predetermined groups. Therefore this analysis is useful to predict group membership in two or more mutually exclusive groups, and thus can be used in psychology studies aiming to identify risk factors in relation to a certain outcome.

In the case of the present study, the first important step necessary to perform discriminant analysis was to define the groups, or in other words the dependant variables. Evidently, one of these groups had to reflect risk of bipolar disorder so that secondarily I could identify which combination of factors (measured variables) would predict group membership, thus identifying risk factors to increased likelihood of developing bipolar disorder. To avoid using cut off scores for the HPS and thus preventing the examination of the complete range of scores, I chose to use cluster analysis to group participants in ‘at risk’ and ‘not at risk’ of bipolar disorder. Thus, the decision was made to consider both the HPS total scores and the Depression (BDI-II) scores to perform two-step cluster analysis in SPSS, having in mind that the resulting clusters would reflect a combination of scores indicative of ‘at risk’ of developing BD.

4.4.1 Two-Step Cluster Analysis

This kind of cluster analysis is an exploratory technique designed to uncover naturally occurring clusters within a data set. The analysis' results suggested that utilizing hypomania (HPS) and depression (BDI-II) scores to cluster participants was indeed a suitable proposition and there was strong evidence to support this cluster structure. The model summary results indicated a good fit to the data (Kaufman & Rousseeuw, 1990) with four emerging groups; each group was conformed by approximately a quarter of the overall number of participants in this sample, which is ideal. Given that according to literature hypomania is a good indicator of at risk of bipolar disorder (Bechdolf et al., 2010; Alatiq et al., 2010), clusters 1 (N=539) and 4 (N=677) were both considered to be 'at risk' groups; cluster 2 (N=528) was characterized by depression scores above the mean, whilst cluster 3 (N=581) was constituted by those who scored lower than average on both measures, making them the 'control' group (see Chart 4.14). Groups were labelled as follows: cluster 1 'Mixed', cluster 2 'Depressed', cluster 3 'Controls' and cluster 4 'Hypomaniac'.

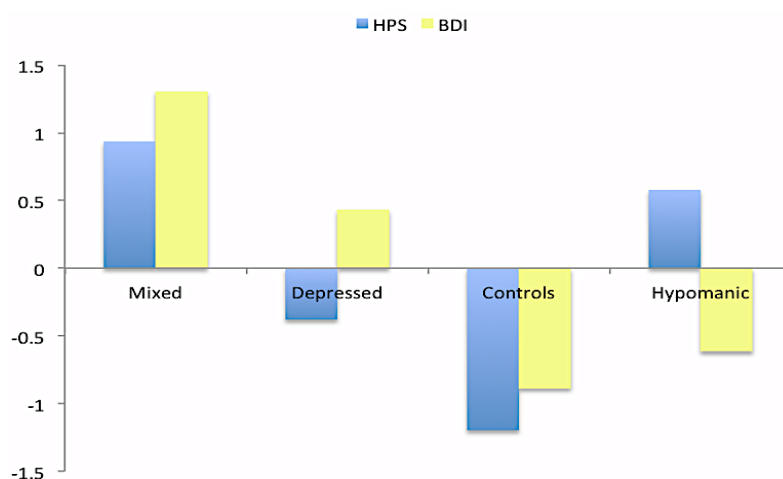


Chart 4.14 Groups resultant from cluster analysis

4.4.2 Discriminant Analysis

Once the clusters had been defined and thus a grouping variable was fixed, the stepwise discriminant analysis was performed to identify the best set of factors that would help discriminate between groups and predict group membership, all with the intention to predict bipolar disorder risk. The following predictor variables were entered for the analysis: i) Reflective functioning, ii) the Internal State Scale indices of well being, activation and perceived conflict, iii) the three insecure attachment dimensions as measured by the Relationships Scale Questionnaire (autonomous, anxious and avoidant), iv) the five metacognition dimensions as well as the overall score for the Metacognitions Questionnaire, and v) the four emotion regulation dimensions as measured by the Regulation of Emotions Questionnaire. Based on the equality of group means it was determined that there were statistically significant mean differences between groups for all independent variables ($p < .01$), with internal dysfunctional emotion regulation and negative metacognitions producing very high F values, suggesting that these may be of particularly good discriminating power. On the contrary, due to small F values and as a result of the stepwise analysis approach, the ‘cognitive confidence’, ‘need to control thoughts’ and ‘negative beliefs about worry’ variables were left out of the subsequent analysis. The omission of these three variables is supported by the pooled within groups matrices correlations table, since we can see that these subscales inter-correlations are high, causing multicollinearity and increasing the standard errors. Box’s M test results indicated a violation of the assumption of equality of covariance between groups, but according to the consulted literature a significant result is not an important problem with large samples

(Klecka, 1980). In this study Box's M was 1411.368 with $F = 4.431$ significant at $p < .001$. Moreover, the summary of canonical discriminant functions indicated the presence of three significant functions (see Table 4.18); however, function 1 stood out as the most important one given that it explains 67% of the variance between groups (see Table 4.19). Based on the structure matrix one can observe that the three identified functions seemed coherent, with the first one being mainly characterized by emotion dis-regulation and negative metacognitions, whilst the second one was constituted by more positive attributes such as well being and functional emotion regulation strategies. (see Table 4.20). Lastly, function 3 was characterized by anxious insecure attachment and cognitive self-consciousness. By looking at the structure matrix one can confirm that the variables used during the SEM phase, are certainly within the most important variables in terms of their discriminant ability, which in itself substantiates the SEM results. At this point the decision was made to label the functions after their most representative independent variable: function 1 was labelled 'dysfunctional emotion regulation (DER)', function 2 'well being (WB)' and lastly function 3 'insecure attachment (IA)'.

Table 4.18 Significant discriminant functions				
Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 3	0.351	2318.524	42	.000
2 through 3	0.837	394.462	26	.000
3	0.963	84.114	12	.000

Table 4.19 Identified discriminant functions

Function	Eigenvalue	%Variance	Cumulative %	Canonical correlation
1	1.384	66.8	66.8	.762
2	.151	20.5	87.3	.362
3	.039	12.7	100	.194

Table 4.20 Structure Matrix of the Discriminant Analysis Functions

	Functions		
	DER ^a	WB ^a	IA ^a
REQ Internal dysfunctional emotion regulation	.669*		
ISS Perceived Conflict	.663*		
REQ External dysfunctional emotion regulation	.578*		
MCQ Total score	.577*		
ISS Activation Index	.550*		
MCQ Negative beliefs about worry ^b	.528*		
MCQ Need to control thoughts ^b	.516*		
MCQ Cognitive confidence ^b	.427*		
MCQ Positive beliefs about worry	.232*		
ISS Well Being		.763*	
REQ External functional emotion regulation		.486*	
REQ Internal functional emotion regulation		.467*	
RSQ Avoidant		-.367*	
RSQ Anxious			.753*
MCQ Cognitive self-consciousness			.381*
RSQ Autonomous			.317*
RF score			-.170*

^a DER=Characterized by Dysfunctional Emotion Regulation / WB=Characterized by Well Being / IA=Characterized by Insecure Attachment

* Largest absolute correlation between each variable and any discriminant function

^b This variable was not used in the analysis

The group means (centroids) of the predictor variables (see Table 4.21) provide information with regards to each group and its profile. In this sample those within the ‘Mixed’ group scored the highest on both function 1 (dysfunctional emotion regulation) and 3 (insecure attachment), whilst scoring the lowest on function 2 (well being). On the other hand, ‘Controls’ scored the lowest on both functions 1 and 3. Interestingly, this group did not score the highest on well being, in fact it was the ‘Hypomanic’ group that did. One possible reason for this is the association between hypomania and increased energy levels, which can be regarded as a positive experience and indicative of a generalized sense of well being.

With respect to the ‘Depressed’ group, results suggest that it is the lack of well being in combination with insecure attachment and dysfunctional emotion regulation that best depicts the profile of those within it. This profile is the same as that of the ‘Mixed’ group, with the difference that in this group means are significantly higher for functions 1 and 3 and slightly lower for function 2. Given that both groups, ‘Mixed’ and ‘Depressed’, share the aspect of having depression scores above the mean, it is worthwhile noting their similarities and differences. The group centroids results suggest that the presence of hypomania, in mixed versus depressed groups, accentuates the dysfunctional emotion regulation, negative metacognitions and insecure attachment aspects, whilst it further diminishes the sense of well being.

Likewise, ‘Controls’ and ‘Hypomanic’ share profile characteristics, specifically with regards to function 1 and 2. In the case of these groups, both have negative dysfunctional emotion regulation scores and positive well being scores. However,

there is a striking difference with regards to function 3, where ‘Hypomaniac’ scored positive and ‘Controls’ scored negative. Moreover, the actual size of the difference is noteworthy and suggestive of insecure attachment being a risk factor to hypomania.

Finally, the analysis revealed that 62% of participants were classified correctly into their group. This percentage is called hit ratio and indicates the overall predictive accuracy of the discriminant functions. ‘Controls’ (74%) were classified with slightly better accuracy than ‘Mixed’ (71%), followed by ‘Depressed’ (53%) and ‘Hypomaniac’ (47%). Comparing the hit ratio to what could be achieved by chance is a good indicator of whether it is an acceptable hit ratio or not. 25% greater than what could be achieved by chance is an acceptable hit ratio. In the case of this study, given that all 4 groups were roughly equal in size, a 25% hit ratio would be expected by chance anyway. Therefore, the overall 62% hit ratio is considered acceptable.

Table 4.21 Canonical discriminant functions evaluated at group means

Group	Function		
	DER	WB	IA
Mixed	1.659	-0.611	0.446
Depressed	0.097	-0.598	0.229
Controls	-1.235	0.329	-0.743
Hypomaniac	-0.327	0.658	0.106

DER=Characterized by Dysfunctional Emotion Regulation / WB=Characterized by Well Being / IA= Characterized by Insecure Attachment

In order to further understand how depression and hypomanic traits relate to actually having a bipolar disorder diagnosis, the number of participants with and without bipolar diagnosis was counted for each of the four clusters (see Table 4.22). It is worth noting that the percentage of participants, who report having a diagnosis within the mixed group, is much higher than in the group with just high levels of hypomanic traits. Similarly, those who score high on depression only seem to report having a bipolar diagnosis more than those with just high scores on hypomanic traits. Although this is a community sample and diagnosis was not confirmed, the fact that the percentage of diagnosis in the control group is so low, whilst it is high in the mixed group, suggests that participants reported their diagnosis accurately.

Table 4.22 Having a BD diagnosis based on HPS and BDI-II scores

	Cluster*				Total
	Mixed	Depressed	Controls	Hypomanic	
Percentage with BD	52%	19%	3%	12%	-
Yes BD Diagnosis	N=279	N=102	N=15	N=82	N=478
No BD Diagnosis	N=260	N=426	N=566	N=595	N=1847
Total	N=539	N=528	N=581	N=677	N=2325

*This clusters correspond to those described above, which were derived from the cluster analysis.

4.5 Conclusions

The results presented throughout this section suggest that people with high internal dysfunctional emotion regulation are at increased risk of becoming depressed, which will impact on their well being, and only in this scenario will insecure attachment and dysfunctional emotion regulation positively predict risk of bipolar disorder.

Internal dysfunctional emotion regulation does not positively predict hypomania on its own. This is shown in the structural equation models and substantiated by the discriminant analysis results. Moreover, as expected, anxious insecure attachment does not have a significant direct impact on people's moods, however it does play a crucial role in predicting dysfunctional emotion regulation, which in turn influences high and low mood, and negative metacognitions. Similarly and as hypothesized, insecure attachment predicted reflective functioning, although only weakly. In spite of this, hypotheses with regards to reflective functioning were supported by the data. In fact, the results from the indirect paths in structural equation models suggest that reflective functioning has statistically significant, though relatively low predictive power when indirectly predicting bipolar proneness. However, RF did not mediate the relationship between anxious attachment and dysfunctional emotion regulation since the direct relationship between these constructs was substantially and consistently more important in all the tested models. Lastly, it was hypothesized that depressive symptoms and negative metacognitions would hold an association to increased risk of developing bipolar disorder. The results show that this hypothesis is partially supported, given that depression only predicted bipolar proneness indirectly through impaired well being, whilst negative metacognitive beliefs directly but negatively predicted it. In summary, two out of the six tested hypotheses were rejected, given that the evidence did not support the notion of reflective functioning serving as a mediator between attachment and emotion regulation, nor the idea of depressive symptoms being directly associated to increased risk of developing bipolar disorder. These results in terms of the associated theoretical and clinical implications will be discussed in the following section.

Section 5

Discussion: the implications of a developmental perspective on vulnerability to bipolar disorder

Section 5

Discussion: The implications of a developmental perspective on vulnerability to bipolar disorder

Introduction

This section will examine the implications of the results previously presented, in terms of how these would extend our understanding of the developmental factors underlying proneness to developing bipolar disorder (BD). The research questions and hypotheses that prompted this study will be used to guide the following discussion.

5.1 Psychological risk factors for developing bipolar disorder

This study's main focus was to examine the psychological risk factors for bipolar disorder. Attachment style as a risk factor was at the core of this project's interests, along with the two other crucial traits that have been closely linked to attachment style in developmental theory, namely reflective functioning and emotion regulation capacity. The three developmental aspects were considered along with cognitive factors and mood indicators to build up a model representative of the 'at risk of developing bipolar disorder' psychological picture. Therefore, I will begin by focusing on the findings surrounding the developmental and cognitive factors that were measured in this sample, and their relationship to increased likelihood of bipolar disorder onset. Results from the various statistical analyses that were performed will be integrated and discussed jointly in the light of existing relevant literature.

5.1.1 Insecure attachment as a predictor of dysfunctional emotion regulation and reflective functioning

It was hypothesized that insecure attachment would directly predict both dysfunctional emotion regulation and reflective functioning.

In this study anxious insecure attachment was found to be a very strong predictor of internal dysfunctional emotion regulation and a modest predictor of reflective functioning (RF). The directionality of the relationship between attachment insecurity and emotion dysregulation was positive. This is suggestive of increased insecure attachment being a predictor of greater use of internal dysfunctional emotion regulation. This outcome is expected given that effective emotion regulation skills arise as a result of a healthy and safe parent-infant relationship that fosters secure attachment (Fonagy & Target, 1997). In early infancy, affect regulation occurs when children recognize and then internalize a representation of an emotion, based on the caregiver's initial response to it. The internalized representation of the emotion serves as a second order strategy of emotion regulation. Therefore if the caregiver is unavailable, unpredictable or insensitive, as in the case of insecure attachment, then the parental relationship is unlikely to provide the necessary basis for the infant to develop emotion regulation skills that are functional and beneficial (Fonagy & Target, 1997). On the other hand, the results showed that the directionality of the relationship between anxious insecure attachment and reflective functioning was also positive, implying that higher reflectiveness is predicted by insecure attachment, which differs from theory and what was expected. A possible explanation for this is that insecurely

attached individuals developed RF as a coping strategy to try to understand or placate a parental figure that is unpredictable or uncaring, or it may be that RF is developed later in life as a coping strategy to deal with feelings of insecurity and worry within the context of intimate relationships. However, it is important to note that although literature points at the acquisition of reflective functioning being linked to secure attachment (Fonagy & Target, 1997), this association is not exclusive and thus RF non-existent in the presence of insecure attachment. In fact the same data used by Fonagy and Target (1997) to establish the link between secure attachment and RF, supports the idea that although insecure attachment hinders reflective functioning acquisition, it does not completely undermine it. Moreover Fonagy and Target's study (1997) is suggestive of the presence of other factors like individual disposition as having an impact on the capacity to reflect, its acquisition and development. Nonetheless, although reflective functioning in the presence of insecure attachment is attainable, it does not hold the same central and effective role as a facilitator of self-organization (Fonagy & Target, 1997). If reflective functioning is developed within the context of unpredictable parenting, it is unlikely that it will help integrate a sense of self worth, security and autonomy. It will allow the infant to better understand the parent's mental state but it will not necessarily promote the capacity to reflect on his own states of mind and facilitate understanding and management of his own emotions (Fonagy & Target, 1997). Furthermore, it is worth noting that because no secure attachment category emerged from the factor analysis conducted for the RSQ, there was no way to test the predictive ability of secure attachment on RF and only a modest strength predictive relationship between insecure attachment and RF could be observed for this sample.

The relationships between insecure anxious attachment, reflective functioning and emotion dysregulation were expected given the existent literature that supports the notion of these constructs being linked (Fonagy et al., 2004; Fonagy & Target, 2002; Fonagy et al., 1998; Fonagy et al., 1996). However, the present study adds to this body of work by incorporating these developmental elements into a structural equation model that aimed to clarify which risk factors underlie the increased likelihood of developing bipolar disorder. Thus this study contributes to the existing literature by highlighting the relationship amongst these concepts within the context of identification of increased likelihood of developing severe mood instability. Also noteworthy is that it does so with a large sample, which is uncommon given that most studies looking at these developmental aspects limit themselves to smaller samples due to assessing attachment and/or reflective functioning via in-person interviews (Fonagy et al., 1998).

5.1.2 Insecure attachment as a risk factor for proneness to bipolar disorder

It was hypothesized that insecure attachment would indirectly predict bipolar disorder proneness through dysfunctional emotion regulation, thus that insecure attachment would be a risk factor to increased likelihood of developing bipolar disorder.

In this study, anxious insecure attachment was found to be a risk factor of increased vulnerability to develop bipolar disorder. This is evident in the SEM analysis and is also substantiated by the discriminant analysis results. In the structural models anxious insecure attachment indirectly and positively predicted bipolar proneness, but only if

the relationship was mediated by current depressive symptoms and subsequent impaired well being. However, the indirect effect of anxious insecure attachment on bipolar proneness was negative when the relationship was mediated by either dysfunctional emotion regulation only or negative metacognitions regarding the need to control one's thoughts. These findings are suggestive of insecure attachment being a risk factor for bipolar disorder if perceived well being is being affected by depressive symptoms stemming from internal dysfunctional emotion regulation strategies. Furthermore, it can be inferred that whilst depression and low well being increase the risk of BD, negative metacognitive beliefs concerning the need to control one's thoughts and internal dysfunctional emotion regulation on its own, seem to lessen this risk. This evidently counterintuitive finding will be further discussed below.

Previous studies have already highlighted the relationship between insecure anxious attachment, depressive symptoms, negative metacognitions and impaired well being. It has been identified that individuals with an anxious type of attachment tend to overreact and exacerbate their emotional responses to seek attention and ensure support from others. However, this tendency to exaggerate also leads to increased levels of negative metacognitions such as rumination, low mood, anxiety and a diminished sense of well being (Dozier et al., 1999; Ma, 2006; Wei et al., 2005; Burnette et al., 2009).

On the other hand, the notion of a model of 'bipolar disorder risk' where depression and cognitive factors have a fully mediational effect on developmental factors, such as anxious insecure attachment, is rather novel. The available literature has for the most

part focused on the link between insecure attachment and bipolar disorder by inquiring into the early childhood experiences of diagnosed bipolar patients, whilst mediation effects have been understudied (Alloy et al., 2005). Moreover the notion of insecure attachment being more influential when proneness to bipolar disorder (as measured by the presence of substantial hypomanic traits) is predicted by depression, is consistent with the manic defense hypothesis (Bentall, 2003) suggestive of mania being a form of depression and not its polar opposite. In line with the manic defense hypothesis, hypomanic traits emerge as a way to deny a psychic reality that is tinted with negative feelings and depressive anxiety. This defense mechanism is unconscious and emerges during early stages of development within attachment interactions, due to depressive mood being perceived as threatening to the self (Bentall, 2003). The data presented here for this study suggests two possible predictive routes for the hypomanic personality (prone to bipolar disorder). If the hypomanic personality emerged as a result of depressive mood, then the manic defense hypothesis is being supported, and indeed the likelihood of developing bipolar disorder increases (see Table 4.22). However, if depressive symptoms do not underlie the hypomanic personality then the latter does not seem to pose such a big risk to develop bipolar disorder (see Table 4.22), in which case it does not support the manic defense hypothesis either.

The above findings are to an extent consistent with previous studies, which have highlighted depression as an underlying element of mania and hypomania (Bentall & Thompson, 1990; Lyonn et al., 1999; Van der Gucht et al., 2009). In a study by Bentall and Thompson (1990), students with high scores on hypomanic traits were compared to those with low scores on an emotional Stroop test where they needed to identify

depression or euphoria related words. Hypomanic students' performance turned out to be comparable to that of depressed patients, with those scoring high on hypomanic traits finding it more difficult to identify depression related words. Moreover, in another study Lyonn et al. (1999), found that manic patients as depressive patients tend to attribute negative external events to themselves, suggesting that mania's underlying mechanisms are similar to those seen in depression, then challenging the notion of these two mood states being polar opposites. In a more recent study Van der Gucht et al., (2009) found substantial evidence of the existence of a negative cognitive syndrome underlying both manic and depressive mood states as well as euthymic states amongst those with bipolar disorder. Thus they concluded that depression is not a state related factor but a vulnerability trait that can trigger bipolar characteristic symptomatology. These observed similarities between manic and depressed patients imply that there are latent negative self-representations that remain present during both manic and depressive episodes, and so the manic defense gets triggered to protect the self against feelings of worthlessness and lack of self-esteem.

However, as previously stated the data also suggested that hypomania not preceded by depression signifies a considerably less important risk factor for developing severe mood instability. In the SEM analysis internal dysfunctional emotion regulation and negative metacognitions are both strong negative predictors of hypomanic traits. From this, one can infer that it is conceivable that hypomania is perceived and experienced as something positive. Again, looking at the discriminant analysis helps explain the results as one can see that individuals who present high levels of hypomania but no depression report not just similar, but in fact higher levels of well being than healthy

controls. Overall, this supports the assumption of hypomania being felt as positive when depression is not current; therefore it provides an explanation as to why internal dysfunctional emotion regulation and negative metacognitions do not positively predict risk of bipolar disorder when this is not preceded by depression (see Tables 4.21 and 4.22).

In conclusion, in this sample insecure attachment is a positive predictor of increased risk of bipolar disorder, provided that it is also a positive predictor of low mood resulting from the inability to functionally regulate emotions. When depression is present, individuals experience a diminished sense of well being and this positively predicts risk of bipolar mood instability. This supports the findings of Schwannauer et al. (2011), who also found a significant predictive relationship between dysfunctional strategies used to regulate emotions and increased depression concurrent with decreased well being. This also resonates with Bentall's (2003) review of the major role that depressed mood plays in psychiatric conditions and the importance of examining all disorders by considering the possibility of underlying depression first.

The link between insecure attachment and psychopathology has been previously explored and established by other researchers (Fonagy et al., 1995, 1997; Carlson et al., 1995; Dozier et al., 1999). Moreover, the link between insecure attachment and bipolar disorder has also been examined (Alloy et al., 2005). However this study adds to the current body of knowledge by recognizing some of the specific mechanisms mediating the relationship between insecure attachment and proneness to develop bipolar disorder.

5.1.3 Reflective functioning as a mediator of insecure attachment and dysfunctional emotion regulation

It was hypothesized that reflective functioning would mediate the relationship between insecure attachment and dysfunctional emotion regulation, however the data did not support this notion. In this sample reflective functioning did not serve as a mediator of the relationship between attachment insecurity and dysfunctional emotion regulation.

In the context of this sample, anxious insecure attachment and internal dysfunctional emotion regulation seem to hold a strong and direct relationship, irrespective of reflective functioning. This contradicts the literature (Fonagy & Target, 1997) which suggests that affect regulation, impulse-control, self-monitoring and self-agency are closely linked to the capacity for reflective functioning, whilst the latter is somewhat dependent on the availability of a primary caregiver to ascribe meaning to psychological experiences of the infant.

One possible interpretation of why, in this sample, RF did not mediate the relationship between insecure attachment and dysfunctional emotion regulation is that these relationships may be correlations rather than mediation. The statistical analysis supports the notion of these concepts being closely linked and predictive but only to a small degree, which suggests the possibility of the relationships being correlational instead. Providing that one does not think about attachment patterns as mutually exclusive categories, but instead as continuous levels or degrees of avoidance and anxiety (Bartholomew & Horowitz, 1991), then it is conceivable that the concepts of

insecure attachment, reflective functioning and dysfunctional emotion regulation co-vary. Another explanation is that perhaps if reflective functioning were even more accurately estimated, then the magnitudes of the predictions would be higher and the possibility of having a meditational effect could be increased. As a reminder to the reader, the correlation between the used RF measure and the ‘gold standard’ was statistically significant but not perfect, indicating a moderate relationship between measures (see Section 2.3.3). Possible approaches to improve the online assessment of RF, and thus the accuracy of the measure, will be addressed later in this section.

5.1.4 Reflective functioning as a risk factor for proneness to bipolar disorder

It was hypothesized that reflective functioning would indirectly and negatively predict proneness to bipolar disorder. Thus it was expected that low reflective functioning would be a risk factor to increased likelihood of developing bipolar disorder given that it would hinder the ability to functionally and effectively regulate emotions.

In this sample reflective functioning was a predictor of increased risk to develop bipolar disorder. The SEM analysis indicated that the relationship between RF and bipolar proneness is indirect and stronger when reflectiveness is not considered to directly stem from insecure attachment. This is interesting in itself since it suggests that although there is a relationship between these concepts, they may not be interdependent. In line with what was expected, reflective functioning directly and negatively predicted internal dysfunctional emotion regulation whilst it indirectly and negatively predicted depression, negative metacognitive beliefs and likelihood of

developing bipolar disorder if depressive symptoms were current. This is consistent with the literature that suggests reflective capacity is a core element of resilience and psychological health, thus it promotes effective emotion regulation and protects against adult maladjustment such as low mood and negative metacognitions (Fonagy et al., 1991,1994). Moreover, reflective functioning also indirectly but positively predicted well being, which is also consistent with the literature that indicates reflective capacity can buffer the effects of environmental adversity, experienced mainly in early childhood, and thus it can help protect the individual from developing psychological disturbances that lead to impaired social functioning and diminished well being in adulthood (Fonagy et al., 1994; Macintosh, 2013).

However, same as with insecure attachment, a positive indirect relationship between RF and bipolar proneness was identified, when the relationship was just mediated by dysfunctional emotion regulation strategies but not depression. This suggests that individuals with hypomanic personality traits have increased reflective capacities if they are not experiencing depressive symptoms. This is not surprising considering the pattern of results discussed throughout this section. So again it seems like hypomanic personality alone is not as debilitating and thus such a strong indicator of vulnerability to experience severe mood instability. It is the combination of hypomanic traits and current depressive symptoms that best depicts increased risk of developing bipolar disorder in this particular sample. Kwapil et al. (2000) reported similar results, with regards to hypomanic personality not being equally strong as a predictor of BD by itself, as it was when it coexisted with other factors such as marked nonconformity and impulse control problems. Additionally, in their 13-year longitudinal study Kwapil et

al. (2000) found that scoring high on the hypomanic personality scale (HPS) did not predict significantly lower overall functioning. In fact, individuals with a hypomanic personality exceeded controls in professional achievement, level of education and financial success, which could suggest a tendency for high HPS individuals to present above average levels of intelligence. Furthermore, Fonagy and colleagues (1998), found RF to be positively correlated with IQ and education level. These findings together provide a plausible explanation as to why RF positively predicted increased likelihood of developing BD, as measured by the presence of hypomanic personality traits (HPS).

Alternatively, going back to Abraham's (1911) manic defence theory (as cited by Bentall, 2003), it is also possible that this apparent increased reflective capacity is an expression of the defensive self that has emerged to protect the idealized self from depression and associated symptoms such as guilt and shame. To Abraham (1911) the manic defence is narcissistic in nature and thus motivated by an abnormal need for external approval (as cited by Bentall, 2003). Therefore, it is conceivable that the increased need for validation encourages those with a hypomanic personality to reflect about their social interactions and how to sustain them. Also, one could argue that the use of this kind of defence mechanism suggests the perception of two selves, one inadequate and one idealised. The former needs to be protected and hidden from others, whilst the latter needs to be reinforced. This kind of experience implies the occurrence of a dissociation of the self, which can lead to the expression of false affective states, such as falsely displaying positive affect which does not match internal experience (Fonagy & Target, 1997) as it happens in the manic-defence. Thus,

if the dissociated mind is capable of expressing incongruous affect, perhaps it is also capable of showing a level of reflectiveness that might not match the true understanding they have of others or themselves, and thus will not be as beneficial to facilitate functional regulation of negative affect.

Lastly, in the SEM analysis done by groups, RF seemed to play a more significant role since it was at the core of the differences across indirect paths observed throughout age, gender and diagnosis groups. However, the implications linked to these findings will be discussed further below.

5.1.5 Dysfunctional emotion regulation as a risk factor for proneness to bipolar disorder

It was hypothesized that dysfunctional emotion regulation would directly predict proneness to bipolar disorder. In this data this notion was supported as internal dysfunctional emotion regulation directly and strongly predicted risk of bipolar disorder, but it did so negatively. However, dysfunctional emotion regulation also positively and indirectly predicted proneness to bipolar disorder if depressive symptoms and impaired well being were concurrent.

Affective dysregulation is viewed at the core of many psychological disorders including mood and personality disorders (Kwapil et al., 2000). In this sample, internal dysfunctional emotion regulation strategies do not by themselves predict an increased risk to develop bipolar mood instability. However, they do predict increased risk of

depression, which in turns hinders well being and increases the likelihood of developing bipolar disorder. These results suggest that emotion regulation is an important mediator between attachment related issues and mood instability.

The negative relationship suggests that increased dysfunctional emotion regulation predicts decreased likelihood of having hypomanic traits, which is consistent with the previously discussed findings of hypomanic traits not being a substantial risk factor for severe mood instability. In this sample, individuals with a high score on hypomanic personality, but that were not depressed, reported relatively high levels of perceived well being, thus supporting the notion of them not relying on internal dysfunctional strategies to regulate their affects (Phillips & Power, 2007).

In spite of the above counterintuitive result, overall the analyses unveil internal dysfunctional emotion regulation as the main and more significant predictor of increased risk of developing bipolar mood instability when depressive symptoms coexist with hypomanic traits. Internal dysfunctional emotion regulation was the defining variable within the main discriminant function that emerged from the discriminant analysis (see Table 4.20). This finding leads to the conclusion of internal dysfunctional emotion regulation being the most important predictor of group membership (see Chart 4.14) and thus of proneness to develop bipolar disorder. This main discriminant function, which explained 67% of the variance, also included the external dysfunctional emotion regulation strategies and negative metacognitive beliefs. The functional strategies of regulation of emotion (internal and external) constituted the second function, which was related to increased well being and helped

explain 20% of the variance between groups. These findings are in agreement with the consulted literature (Phillips & Power, 2007), which indicates that using dysfunctional strategies to regulate emotions can intensify the original feeling and generate further distress, whilst functional strategies promote wellbeing. Moreover, internal dysfunctional emotion regulation strategies do not help the individual to process and use the information in a constructive way, but they consist of blocking and rejecting the emotion therefore interfering with positive development whilst fostering secondary negative emotions and further emotional, behavioural and interpersonal problems.

Given that affective dysregulation has been identified as a core component of several psychological disorders, the results from this study that highlight the importance of internal dysfunctional emotion regulation within the context of mood instability are not unexpected. However, they add to the current body of knowledge with regards to bipolar disorder and its associated risk factors. Specifically, these results provide evidence that internal dysfunctional emotion regulation plays a key role as: a) the crucial mediator between adverse early childhood experiences and the later depression that is underlying bipolar disorder proneness, and b) the most important variable within the main discriminant function that best predicts whether a person is at increased risk of developing bipolar disorder or not. So beyond just establishing an association between bipolar proneness and emotion dysregulation, this study highlights the mediational effect of it and its prominent value as a predictor of increased risk of severe mood instability.

5.1.6 Depression and negative metacognitions as risk factors for proneness to bipolar disorder

It was hypothesized that depressive symptoms and negative metacognitions would directly predict proneness to bipolar disorder. In line with these expectations the data indicated that the presence of depression is fundamental to identify risk of bipolar disorder. Current depressive symptoms were highly predictive of diminished well being, which predicted increased likelihood of developing bipolar disorder, supporting Abraham's (1911) theory of the manic defence (as cited by Bentall, 2003), which says that mania or hypomania can be triggered to protect the self from negative underlying mood. Along with this theory it has been proposed that the underlying mechanisms associated to hypomanic states are similar to those of depressive states, and when they become intolerable they precipitate denial as an attempt to regulate the emotions being elicited by the extremely distressing thoughts. These thoughts tend to revolve around feelings of low self-worth, that arise from unrealistic standards for success and unstable self-esteem. Thus denial in the form of manic-like symptoms is employed by the individual as a coping strategy to inhibit the experienced distress and mask the original depression (Bentall, 2003).

On the other hand, negative metacognitive thoughts directly and negatively predicted risk of developing bipolar, suggesting that those with a 'need to control their thoughts' were less likely to develop bipolar disorder. The former indicates that if someone experiences intrusive thoughts regarding the need for cognitive control, their likelihood of developing bipolar disorder diminishes. Given the prevalence of racing thoughts in

hypomania, it was expected that individuals with hypomanic personality traits would report experiencing the need to control their thoughts. But this notion was not supported by the data. As it has been examined previously throughout this discussion, individuals with a hypomanic personality, but who are not depressed, seemed comparable to healthy controls, and in fact reported slightly higher levels of well being. Thus, it is not surprising that a cognitive factor such as the 'need to control one's thoughts' did not predict proneness to bipolar disorder. In fact hypomanic personalities' self-reports with regards to perceived well being leads to believe that they probably enjoy having increased levels of energy and cognitive activity, because it can often result in more creativity and productivity (Eckblad & Chapman, 1986). Moreover, it is worth considering that the measure used to assess the prevalence of negative metacognitions in this sample has been found to correlate with measures of anxiety (Cartwright-Hatton & Wells, 1997), and hypomanic personality individuals have been found to show less anxiety than healthy controls (Eckblad & Chapman, 1986). Furthermore, hypomanic traits have been found to be positively associated with other personality characteristics such as openness, extraversion and decreased conscientiousness (Durbin et al., 2009). These characteristics are also negatively associated to neuroticism (Norris et al., 2007; Van der Linden et al., 2010) characterized by proneness to anxiety and worrying, which are processes thought to be less prevalent in hypomanic personalities.

In summary, the data for this study indicated that increased risk of developing bipolar disorder is predicted by depressive symptoms and a decreased need to control one's thoughts.

5.2 The impact of demographic variables on proneness to bipolar disorder

Three demographic variables, age, gender and diagnosis, were explored regarding their impact on vulnerability to mood instability, as experienced in bipolar disorder. The structural equation modeling analysis suggested that age, gender and diagnosis had an impact on the way the measured variables interrelated to provide a picture of ‘at risk of developing bipolar disorder’. Thus, the SEM results implied that risk of developing bipolar manifests differently depending on gender, age and diagnosis. Given what is known about bipolar illness, these results are not unexpected. From the literature it is known that mood instability problems like bipolar disorder present themselves between late teenage years and early adulthood (Bechdolf et al., 2010; Bauer & Pfenning, 2005), whilst the incidence of hypomanic episodes decreases with age (Kwapil et al., 2000). The latter can be interpreted as age being a significant factor in terms of predisposing or increasing the risk of developing bipolar disorder. With regards to gender, the literature indicates that although there seems to be no significant differences across men and women in terms of age of onset, there are differences with regards to comorbidity (Hendrick et al., 2000; Kawa et al., 2005). For instance, the prevalence of depression amongst females (Piccinelli & Wilkinson, 2000) could underlie the differences found across gender groups regarding likelihood of developing bipolar disorder, particularly in the present study in which depression seems to play such a prominent role. Lastly, diagnosis was used to compare those who reported to have been diagnosed with bipolar disorder to those who reported to have some other mental health diagnosis or none at all. The results supported the expectation of ‘bipolar risk’ expressing itself in different ways across the three diagnosis groups - comparing

people with no diagnosis to those holding a bipolar disorder or other diagnosis seems unlikely to support the concept of invariance across groups.

So although differences in the expression of ‘bipolar risk’ across groups defined by age, gender and diagnosis can be explained based on what is currently known about bipolar disorder, further interpretation of the results arising from the structural equation models suggested that differences in reflective functioning were important when trying to understand why the groups differed. When making comparisons between males and females, the results indicated that the groups were very similar in everything with the exception of reflective functioning. RF seems to play a more important role in the female group since all the indirect effects associated to this capacity reached statistical significance. On the contrary, none of the indirect effects associated to RF reached statistical significance in the male group. However, not many recent studies investigating reflective capacities across gender were found to substantiate or refute these results, but Fonagy et al. (1998) compared participants for reflective functioning across gender and found no significant differences between groups, and neither did MacBeth and colleagues (2011) in their analysis of RF in a sample of 35 individuals that met the criteria for first episode psychosis. Furthermore, comparisons across age groups yielded similar results and it was differences across indirect paths involving reflective functioning that seemed to explain why risk of bipolar disorder is different between the three age groups. All indirect paths involving reflective functioning were statistically significant in the group constituted by individuals aged 36 years and above. This seems to suggest that in older people reflectiveness plays a more important role in facilitating emotion regulation and

preventing mood instability. Another interesting difference between age groups was that within the group of adults in the 26 to 35 age range, decreased well being did not predict proneness to bipolar disorder. Perhaps these participants experience diminished well being due to increased professional and personal demands inherent to the stage in life they are in. For example, it is conceivable that people within this age range are in the process of establishing their careers or starting a family and the diminished perception of well being reflects this, rather than a vulnerability of developing mood instability (Blanchflower & Oswald, 2008). However, this is only a tentative explanation and further research is warranted to clarify the role that RF plays as people get older. Lastly, comparisons across diagnosis followed the same trend and showed that groups were fairly similar apart from differences found regarding reflective functioning and its associated indirect effects. These effects were only statistically significant in the group with no diagnosis, highlighting the association of reflective capacity and mental health. The theoretical relationship between reflective functioning and psychopathology has been substantially discussed in the literature, suggesting that mental health diagnosis is associated with low reflective functioning (Fonagy et al., 1996, 1998; Bateman & Fonagy, 1999, 2004; Fischer-Kern et al., 2010) which could explain why RF effects did not reach statistical significance in those groups that reported a diagnosis.

However, there may be a simpler alternative explanation of why the indirect effects associated to RF are statistically significant in some groups but not in others – this may be due to sample size. In the case of gender differences, the female group is approximately 3 times as large as the male group, thus providing a compelling

explanation as to why relationships that are very small in effect achieve statistical significance in one group and not the other. A similar situation is present in the case of diagnosis differences since the group with no mental health diagnosis was constituted by significantly more participants than the other two groups. However, the differences observed by age do not accommodate to this rationale given that all statistically significant effects are observed within the group constituted by those aged 36 years and above, and not the largest group, which is the one with the youngest participants (16 to 25 years of age). Thus, this seems to support the previous explanation provided of reflective functioning playing a more prominent role in protecting from mood instability as individuals age.

5.3 Clinical implications

Being able to pinpoint risk factors that increase the likelihood of bipolar disorder is clinically relevant since it facilitates the successful identification of individuals who are vulnerable to develop severe mood instability, and enables a better understanding of the aetiology of bipolar disorder. Furthermore, gaining knowledge with regards to the underlying factors that predispose a person to suffer from severe mood instability should facilitate the development and implementation of preventive strategies and suitable treatments. Facilitating prevention is the biggest implication of all studies that examine risk factors underlying adverse outcomes. In the case of this study, the results can be used to identify individuals who are vulnerable to developing severe mood instability, thus making it possible to put in place suitable support that prevents the onset of bipolar disorder. Furthermore, the results can be used in conjunction with the

proposed ultra high-risk criteria previously identified in a help-seeking clinically symptomatic population (Bechdolf et al., 2010). The present study's findings suggest that hypomanic personality on its own does not imply the same degree of risk, as hypomanic traits with underlying depression. It is the combination of these two factors that seems key to identification of vulnerable individuals, whilst internal dysfunctional emotion regulation strategies and insecure attachment are important predictors and mediators of depression and diminished well being. Moreover, from the discriminant analysis it is learnt that dysfunctional emotion regulation along with negative metacognitions seemed to be the most important factors to discriminate between levels of predisposition to bipolar, thus it is implied that these processes are highly related, which should be taken into account within the context of design and implementation of early interventions.

Lastly, this study has attempted to better understand vulnerability to bipolar using attachment theory as a framework for understanding it. The results indicate that anxious insecure attachment fosters the use of dysfunctional strategies to regulate emotion, which in turn triggers subsequent difficulties. This calls for clinicians to take into account the quality of meaningful relationships when assessing risk for bipolar disorder or when treating it. Furthermore, the results suggest that it would be beneficial to tackle these themes and explore relationships, and the mental representations around them, during therapeutic interventions.

5.4 Theoretical implications

Although it was highly suggested in the literature that the developmental variables included in this study were interrelated and linked to pathological mood dysregulation, this study's contribution is to have included all of these factors together in a structural equation model, to better understand vulnerability to bipolar disorder within a vast and diverse sample.

Furthermore the findings from this study provide empirical evidence to support the developmental theory around the emergence of emotion regulation. Results substantiate the claims of insecure attachment prompting dysfunctional emotion regulation, as opposed to just demonstrating an association between the two variables. However the findings also indicate that although relationship amongst developmental variables was established, within the context of severe mood instability reflective functioning is not a mediator of insecure attachment and affect regulation.

Lastly, although the literature suggests that hypomanic traits constitute a risk factor towards mood instability, the results of the present study contradict such claims as they indicated that hypomanic traits do not seem to impose a high degree of risk to develop bipolar disorder, unless accompanied by depression, thus providing strong evidence of the manic defence hypothesis.

5.5 Limitations and suggestions for future research

An important limitation of this project was that because there were no follow up assessments, the stability of the results over time could not be tested. This would be helpful since the study's main aim was to identify risk factors; therefore to confirm that the recognized indicators of vulnerability to bipolar disorder stand the test of time is important, and should be address in future research.

Another shortcoming of this study is the inaccuracy of the reflective functioning assessment. Asking open ended questions via an online survey system to further obtain an overall RF score is novel and somewhat ambitious, thus it should be tested more thoroughly prior to being used in future assessments, whilst the integration of an Eliza (Weizenbaum, 1966) like system to encourage participants to give more detailed answers should be considered. It is conceivable that the online assessment prevented participants from extending on their answers and thus accurately showcasing their reflective abilities. This is why a chatbot, a system capable of probing participants to obtain more detailed answers, could be beneficial. Also, the questions asked could be edited appropriately to elicit better and more thorough answers. These are important considerations since the inaccuracy of the RF scores could very well be behind the weak relationships observed between RF and other measured variables.

Finally, another suggestion for future research would be to include factors such as life events and attributional style as predictors of increased vulnerability to develop bipolar disorder. Given the relationship that these factors seem to hold with depressive

symptoms, it would be interesting to attempt to expand the structural model presented in this work, including such variables as potential mediators of attachment style and proneness to develop bipolar disorder.

5.6 Conclusions

This study's main contribution is towards the better understanding of how potential risk factors, that increase an individual's vulnerability to develop severe mood instability, interrelate. To enable effective treatments it is fundamental to recognize the pathways between risk factors and negative outcomes. To identify the risk factors alone is not enough, as it is the underlying mediators that fully explain the observable outcomes by providing a clear picture of the dynamics behind the mechanisms of transmission.

The results of this study provide compelling evidence of how developmental variables, like insecure attachment and dysfunctional emotion regulation, can trigger unfavorable cognitive functioning and mood instability. The vast sample collected for this study allowed for sophisticated statistical analysis to be carried out and show that insecure attachment emerged as a risk factor due to its direct impact on the capacity to regulate emotions. Similarly, reflective functioning seemed to play an important role as a protective element that can aid emotion regulation and buffer low mood, whilst internal dysfunctional emotion regulation proved to be the most critical element in vulnerability to bipolar disorder because of its direct association with depressive symptoms and negative metacognitions. Moreover, this study's findings support the

manic defence hypothesis. The results presented here suggest that hypomanic traits can be predicted by a diminished sense of well being that results from experiencing depressed mood. Depression undermines an individual perception's of their own well being and thus threatens the individual's sense of self-worth and self-esteem. Therefore, the manic defensive process gets activated, aiming to distract and protect the self from the unpleasant thoughts and feelings associated to low mood.

Table 5.1 Hypotheses testing results			
Hypothesis	Supported	Partially supported	Not supported
1. Insecure attachment will directly predict both dysfunctional emotion regulation and reflective functioning.	✓		
2. Insecure attachment will indirectly predict bipolar proneness through dysfunctional emotion regulation.		✓	
3. Reflective functioning will mediate the relationship between insecure attachment and dysfunctional emotion regulation.			✓
4. Reflective functioning will indirectly predict proneness to bipolar disorder through dysfunctional emotion regulation.	✓		
5. Dysfunctional emotion regulation will directly predict proneness to bipolar disorder, depressive symptoms and negative metacognitions.	✓		
6. Depressive symptoms and negative metacognitions will directly predict proneness to bipolar disorder.		✓	

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Appendices

Appendix 1 – Ethical Approval for the Pilot Study



School of Health in Social Science
Medical School, Teviot Place
Edinburgh
EH8 9AG

Telephone: 0131 651 3972
Fax: 0131 6501 3971

Dear Sonia

Re: Project Title: A comparison between assessing reflective function through the AAI, measuring reflective function online through the six demand questions from the AAI and scoring metacognition using the MCQ-30

Many thanks for submitting the above research project for review by the Clinical Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 1st December 2011. Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

With best wishes,

Yours sincerely,

Dr. Suzanne O'Rourke
Ethics Tutor

Appendix 2 – Ethical Approval for main Large Study



School of Health in Social Science
Medical School, Teviot Place
Edinburgh
EH8 9AG

Telephone: 0131 650
Fax: 0131 650 3891

Email: submitting.ethics@ed.ac.uk

27th June 2012

Sonia Madrid-Cuevas
School of Health in Social Science
Medical School
Teviot Place
Edinburgh
EH8 9AG

Dear Sonia

Re: Interpersonal functioning in Bipolar Disorder: Association between Attachment Style,
Reflective Functioning & Affect Regulation in Bipolar Disorder

Application for Level 2-3 Approval

Thank you for submitting the above research project for review by the Section of Clinical Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved. Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

With best wishes,

Yours sincerely,

Dr. Suzanne O'Rourke


Appendix 3 – The landing front page of the survey

← → ↻ www.psychology-test.co.uk ★ ☰

Psychology Test

Find out more about your personality and relationship style

Find Out More About Yourself



Answer this easy 25 minute [free psychology test](#) to find out more about your personality and relationship style.


For example, learn how you relate to family and friends or romantic partners based on your relationship style.

Participate in Research



This survey is part of psychology research being carried out at the [University of Edinburgh](#), UK. Your participation helps researchers learn more about emotion regulation, which may help those who experience highly changeable moods - [Bipolar Disorder](#).

Tell your Friends



[Share](#) [Share](#)

If you find this test interesting, *share it* with your friends and family! Encourage them to take part and find out more about their personality, and how their scores compare to yours. You will only be sharing the link, not your own results.

[Click Here to Take the Test](#)

Please share this personality and relationship test with your friends:

[Share](#) [Share](#)

[Online psychological health helplines](#)

Appendix 4 – The information sheet as it appears in the online survey

Psychology Test

Find out more about yourself, with this free psychology test

0%

PARTICIPANT INFORMATION

This survey takes about 25 minutes, so put on some music and grab a cup of tea! Please don't press the back button in your browser, and once you start, please answer it in one go - you can't come back to it later. Before you decide if you want to take part, please read the following information.

What will I have to do?

You will be asked to complete a number of questions about your mood, thoughts, emotions and relationships lasting approximately 25 mins. You can choose to see your scores and feedback at the end of the survey. You can leave the survey at any time but your answers from previous pages will be saved.

Will my taking part in this study be kept confidential?

Your answers are recorded purely for research purposes and will be held confidentially in the research team. Individual responses will be anonymised and will not be shared. Should the research lead to publications in scientific journals, your identification details will not be included.

What will I get out of taking part?

Once the survey is complete you will be given the option to see your scores, which will allow you to know a little bit more about yourself.

What are the aims of the study?

The study aims to understand emotion regulation in individuals prone to developing bipolar disorder and analyse the relationship that this disposition holds with attachment style and reflective functioning.

Who can I contact for further information?

You can contact Sonia Madrid at S.Madrid-Cuevas@sms.ed.ac.uk. If you feel you would like to talk to someone about the issues covered in the survey, contact your doctor or browse the following list of helplines: [Mental Help](#) (Intl.), [Saneline](#) (1pm-11pm) 0845 7678000 (UK), [Edinburgh Samaritans](#) 0131 2219999 (Ed)

[Next](#)

Appendix 5 – The consent form as it appears in the online survey

Psychology Test
Find out more about yourself, with this free psychology test

6%

CONSENT DECLARATION

Please read the following statements and check the box to indicate that you agree:

- * I have read and understood the information given on the previous page.
- * I understand that the information obtained from all questionnaires that I complete will be anonymised.
- * I am aware that my participation is voluntary and that I can withdraw from the survey at any time.
- * I am over 16 years of age.
- * I have agreed to complete the following questionnaires

- ☐ Yes
- ☐ No

Next

Appendix 6 – Example of feedback for participants after survey entry completion

Psychology Test
Find out more about yourself, with this free psychology test

94%

SCORES AND FEEDBACK

If you would like to refer to these scores later, please save or print this page.

Remember, this is not a clinical diagnosis. Only a doctor or qualified mental health professional can make a diagnosis. If you have any concerns regarding your scores please don't hesitate to contact your doctor or any of the helplines provided on the next page.

RELATIONSHIP STYLE

The relationship questionnaire (RSQ) tells you about how you relate to family and friends or romantic partners. Most people score something in each category, but it's the highest percentage that indicates the relationship style which characterises you best.

Secure: 14%
You feel worthy of being loved and you expect other people to be accepting and responsive to you. Therefore you feel positive about close relationships and tend to get involved with others without losing your independence.

Fearful: 20%
You have a sense of unworthiness combined with an expectation that others will be untrustworthy and rejecting. You have mixed feelings about close relationships and tend to avoid close involvement with others to protect yourself against rejection.

Preoccupied: 31%
You have a sense of unworthiness combined with a positive view of others. This leads you to strive for self-acceptance by gaining the acceptance of family, friends or partners. You tend to be highly emotional and dependent since you can experience high levels of worry and impulsiveness in your relationships.

Dismissing: 35%
You have a sense of being worthy of love combined with an expectation that others will be untrustworthy and rejecting. You protect yourself against disappointment by avoiding close relationships or by suppressing and hiding your feelings and maintaining a sense of independence and invulnerability. You tend to deny needing close relationships or the value of them.

Relationship Style

Relationship Style	Percentage
Secure	14%
Fearful	20%
Preoccupied	31%
Dismissing	35%

275

MANAGING YOUR THOUGHTS

This questionnaire (MCQ) is to do with your beliefs, judgements and monitoring tendencies relating to your own thinking.

Positive beliefs about worrying: 56%

A value over 20% indicates you believe worrying is helpful when problem solving and is a positive personality trait. You tend to feel anxious when faced with uncertainty.

Uncontrollability and danger: 61%

A value over 18% indicates you believe your worries can be uncontrollable and dangerous. For you to function and feel safe, you need to control your worries. You tend to avoid losing control since this elicits anxiety feelings.

Cognitive confidence: 50%

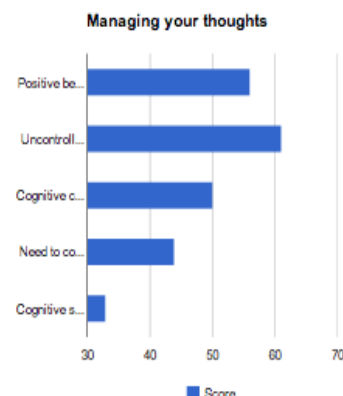
A value over 20% indicates mistrust of your own attention and memory capacity, which often worries you and makes you anxious.

Need to control thoughts: 44%

A value over 13% is related to a greater need to control your negative beliefs about responsibility, punishment and superstition. You think that if you don't control your thoughts, you will be responsible for the damage caused and will be punished.

Cognitive self-consciousness: 33%

A value over 31% expresses high degree of self-involvement with your own thinking, meaning you tend to be aware of and monitor your thoughts regularly.



REGULATION OF EMOTIONS

The regulation of emotion questionnaire (REQ) tells you about how you regulate your emotions. Most people score something in each category, but the highest score indicates the emotion regulation strategy that you use most often.

Internal-functional: 27%

You manage and process your emotions, which allows you to attain your goals and maintain or regain a sense of well-being. For example, you rethink your thoughts or beliefs about a certain feeling in order to understand it better.

Internal-dysfunctional: 27%

You reject or block your emotions which prevents you from processing and using the information provided by an emotion in a helpful way. Instead you deny, mask and hide your feelings by, for example, harming or punishing yourself in some way.

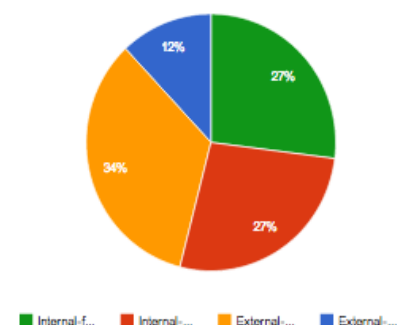
External-functional: 34%

You make use of external resources to manage and process your emotions, which allows you to attain your goals and maintain or regain a sense of well-being. For example, you talk to someone about your feelings in order to understand them better.

External-dysfunctional: 12%

You make use of external resources to reject or block your emotions, which prevents you from processing and using the information provided by an emotion in a helpful way. Instead you deny, mask and hide your feelings by, for example, shouting, arguing or taking your feelings out on others.

Regulation of Emotions



LOW MOOD

Low Mood (BDI): 27%

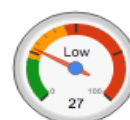
0-21% You are not experiencing low mood.

22-30% Mild low mood which somewhat interferes with your work, social life, etc.

31-44% Moderate low mood which is likely to interfere with your work, social life, etc.

45-100% Severe low mood which markedly interferes with your work, social life, etc.

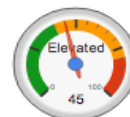
The higher the score the more likely you are to be experiencing feelings of hopelessness, guilt, vulnerability, oversensitivity to criticism, self hatred and lack of confidence. As a consequence you may feel tearful, need constant reassurance and be less interested in things you have previously enjoyed.



ELEVATED MOOD

Elevated Mood (HPS): 45%

Scores above 40% are considered high. The higher the score the more you are prone to experiencing periods of elevated mood characterized by several of the following signs: increased impulsivity, optimism, extroversion, energy and irritability as well as frequent mood changes, lack of restraint and overvaluation of ones significance. These periods can be associated with increased creativity or productivity as well as poor judgment. They distinguish themselves from normal happiness by their persistence, social impairment and the fact they aren't provoked by good news or affected by bad news.



Next

Appendix 7 – List of websites and blogs contacted to disseminate the study

<http://www.onlinepsychresearch.co.uk/researchers/submit-your-study/>
<http://psych.hanover.edu/research/exponnet.html>
<http://allpsych.com/>
<http://www.all-about-psychology.com/psychology-research-participants.html>
http://www.mind.org.uk/help/diagnoses_and_conditions/hypomania (twitter)
<http://psychcentral.com/blog/archives/2008/10/22/top-ten-bipolar-blogs-2008/>
<http://www.spring.org.uk/>
<http://opl.apa.org/>
http://www.elearning.health.ed.ac.uk/clinical_psychology/ecap/
<http://www.facebook.com/HealthyPlace>
<http://forums.about.com/n/pfx/forum.aspx?nav=messages&webtag=ab-psychology>
<http://www.personalityquiz.net/>
<http://www.socialpsychology.org/expts.htm/>
<http://psyresearch.org/online/>
<http://www.psychworld.com/>
<http://www.psych-research.com/>
<http://www.psychblog.co.uk/contact>
<http://thepsychologyforum.com/forum/forumdisplay.php?f=11>
<http://beta.in-mind.org/online-research>
<http://www.iscience.eu/>
<http://www.w-lab.de/lab-united/submit.php>
<http://www.psychstudies.co.uk/index.php>
<http://www.thechangeblog.com/>
<https://www.facebook.com/BipolarChick1>
 Facebook - global clinical psychology students


Appendix 8 – End page of the survey in which a list of websites that helped promote the study, and thus were added to this page, can be seen

← → ↻ www.psychology-test.co.uk/final.html 🔍 ☆ ☰

Psychology Test

Thank you for completing the personality & relationship survey!

Tell your Friends




[f Share](#) [t Share](#)

If you found the test interesting, *share it* with your friends and family! Encourage them to take part and find out more about their personality, and how their scores compare to yours. You will only be sharing the link, not your own results.

The more people who take the test, the more useful our results will be to those who suffer from extreme mood changes. Click the Facebook or Twitter button above, or send your friends an email.

Thanks again - we really appreciate it!


Helplines



If you feel distressed or you would like to talk to someone about any of the issues covered in the survey or your scores, contact your doctor or browse the list of resources and helplines below.

[Mental Help](#) (Intl.)
[Befrienders](#) (Intl.)
[Support Line](#) (UK)
[Health In Mind](#) (UK)
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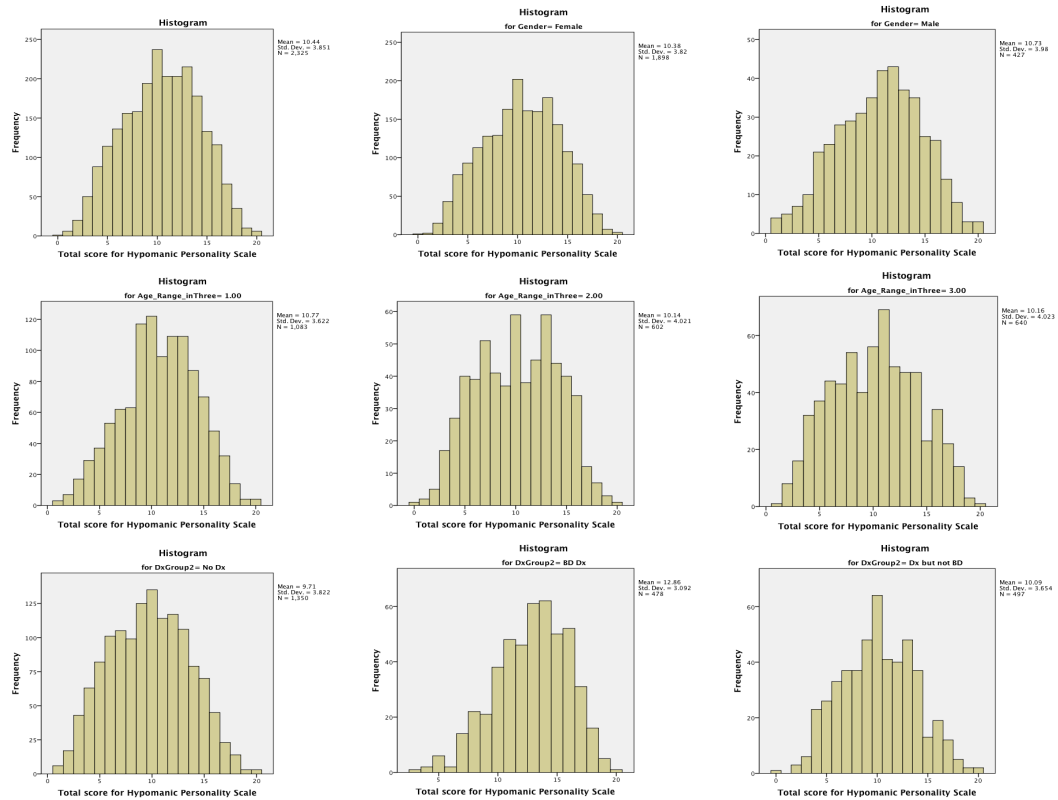
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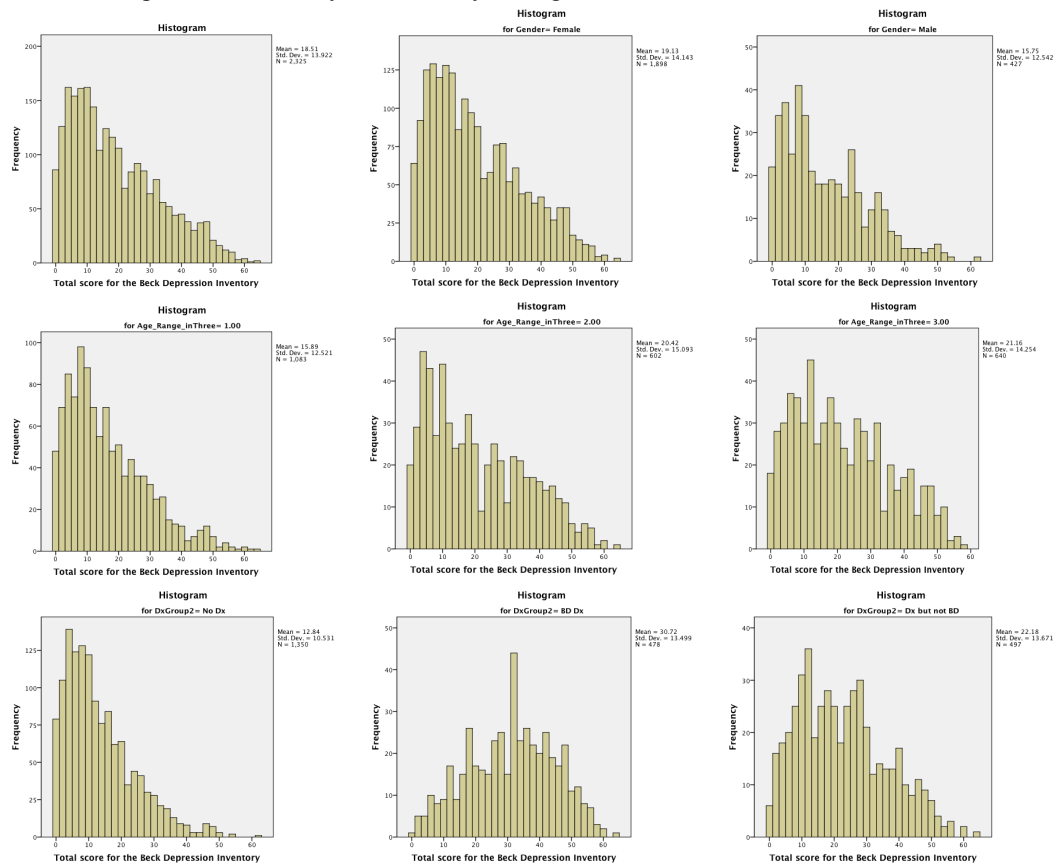
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Appendix 9 – Distribution of the data

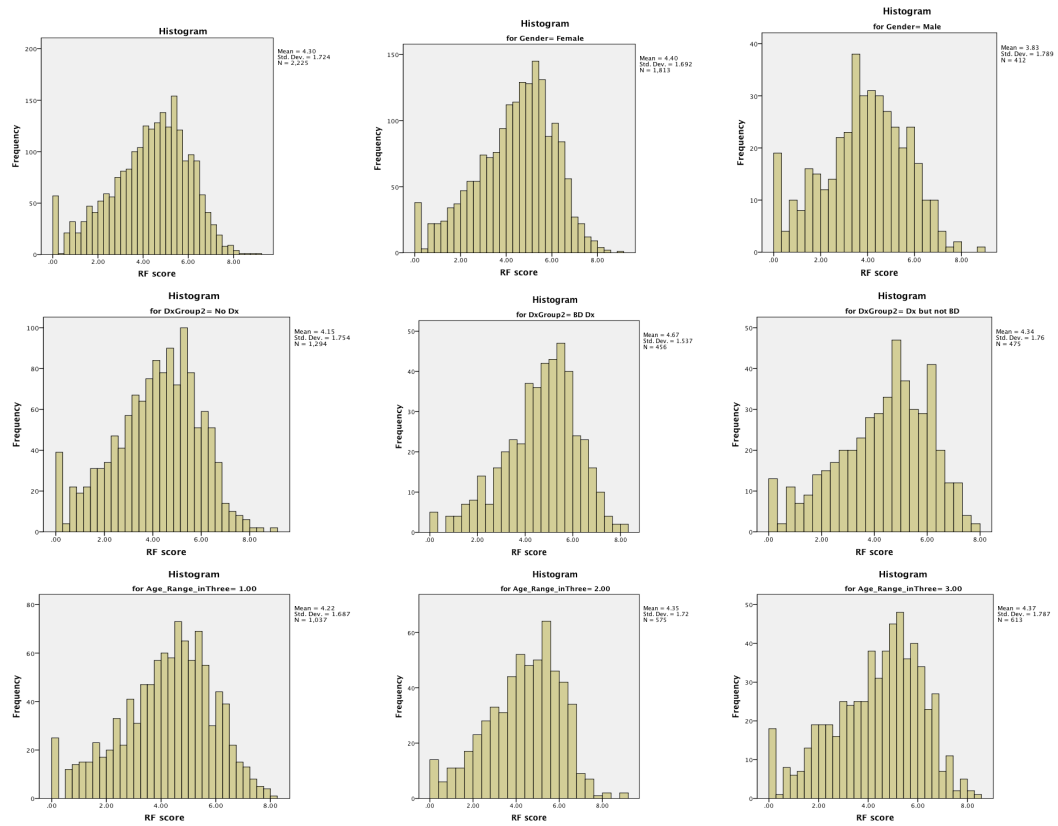
Hypomanic Personality Scale Normality Histograms



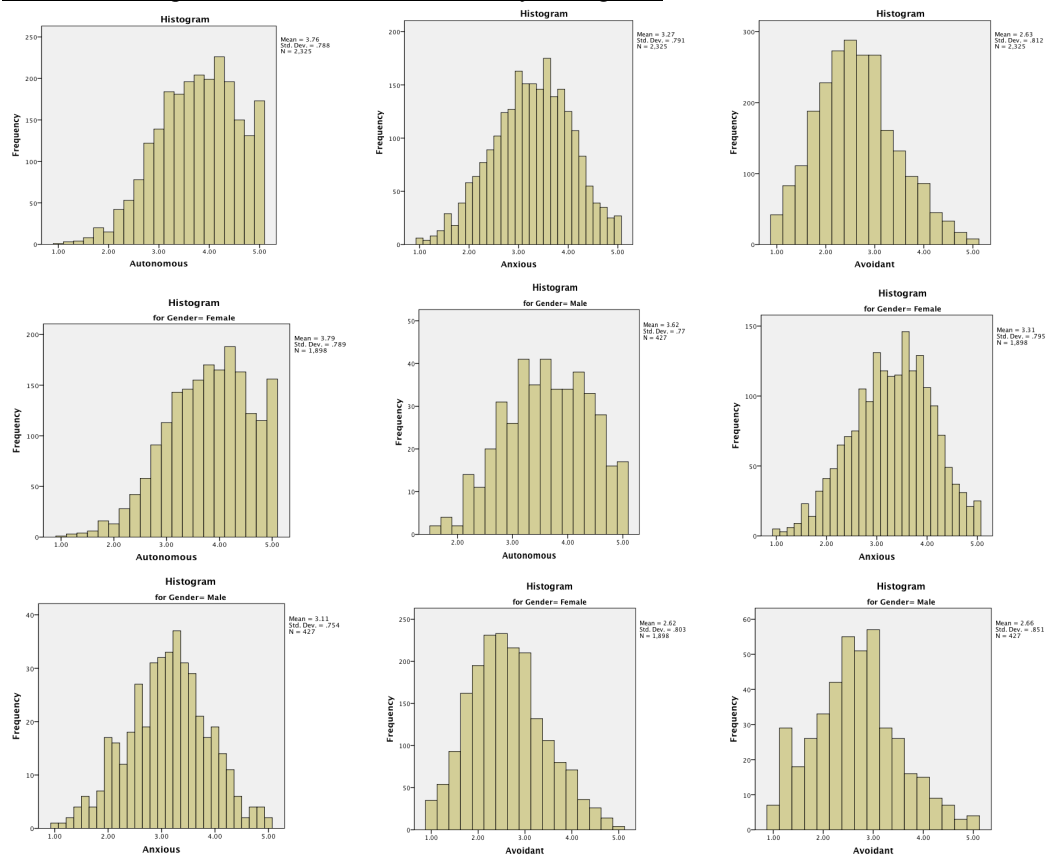
The Beck Depression Inventory-II Normality Histograms

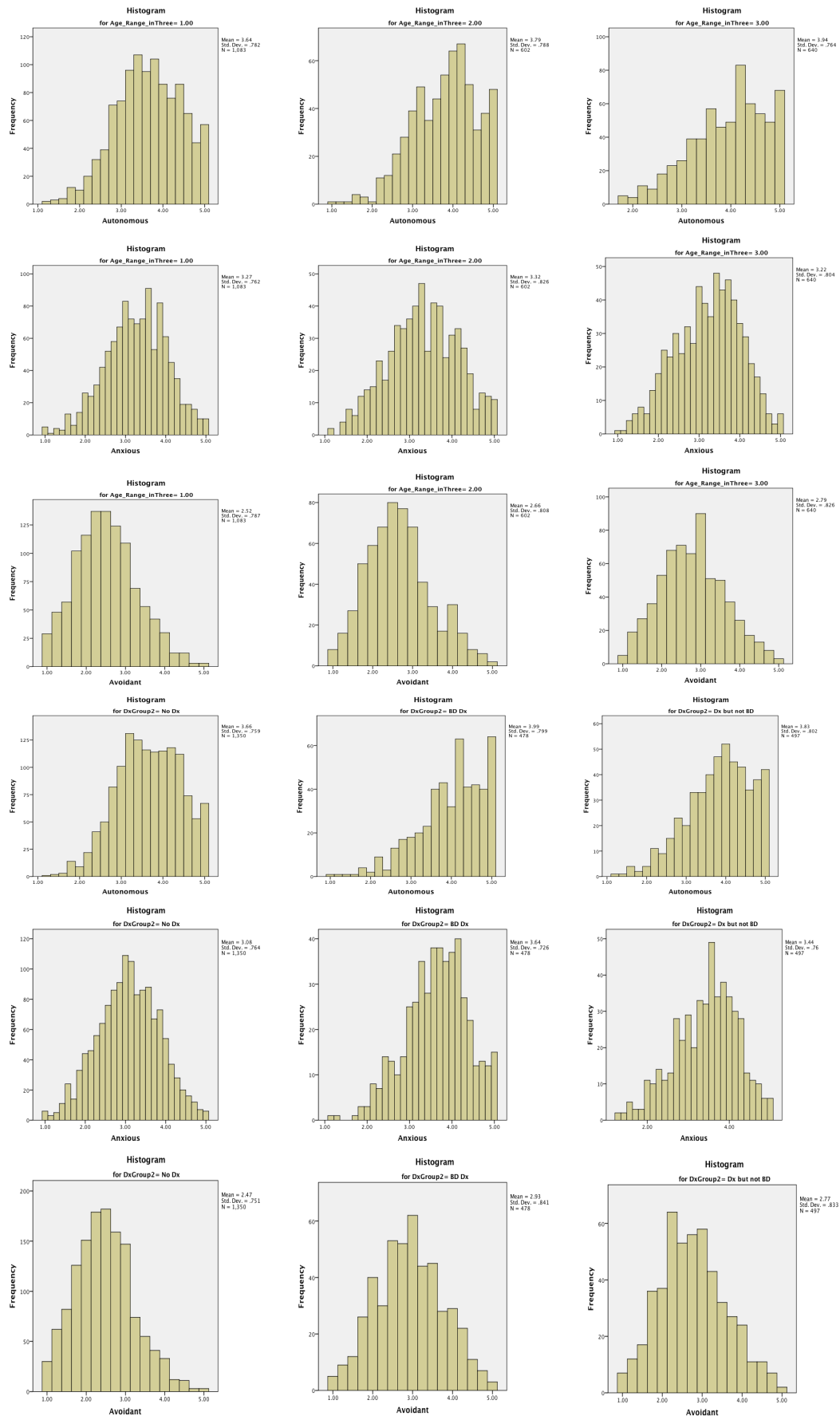


The Reflective Functioning scores Normality Histograms

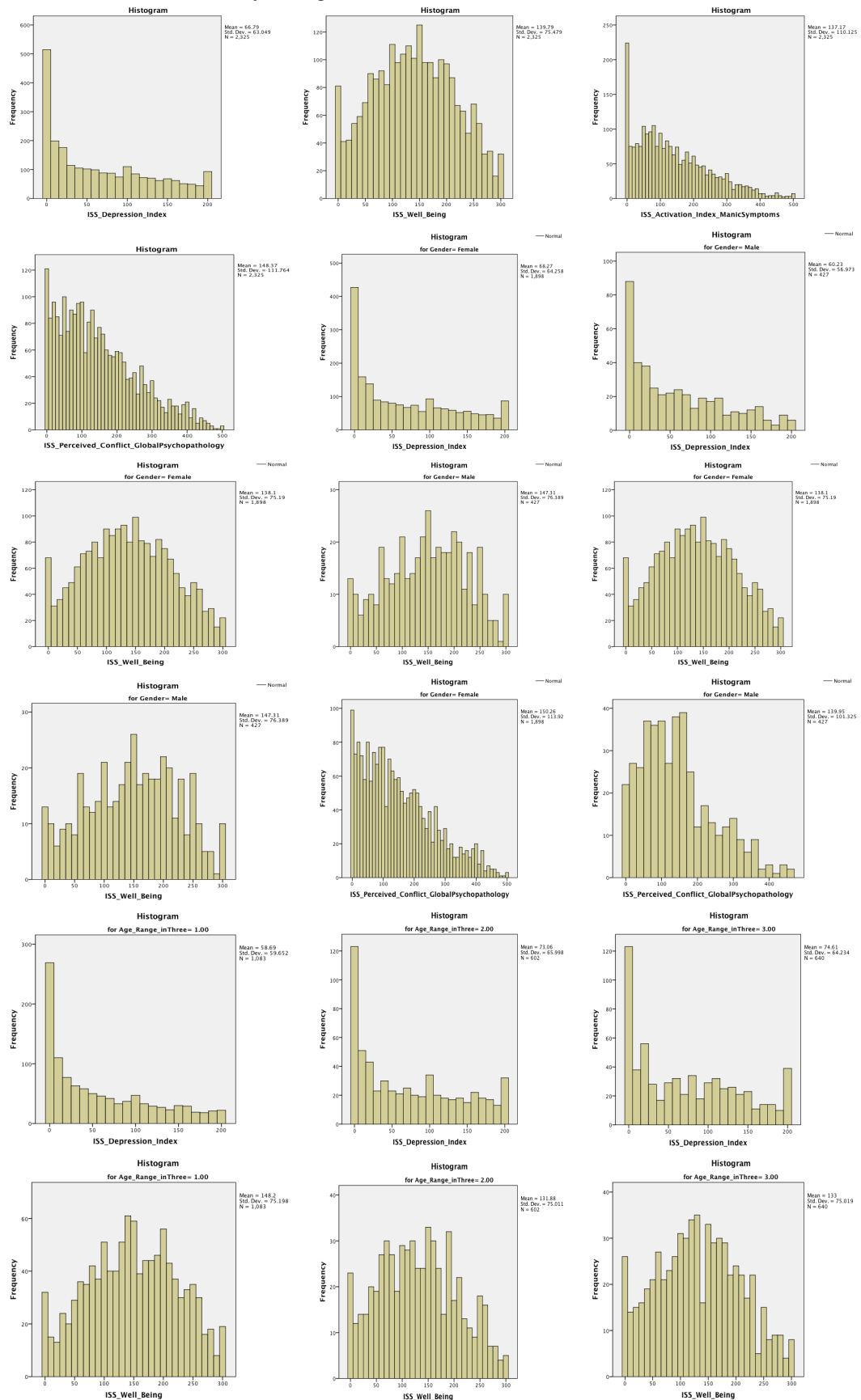


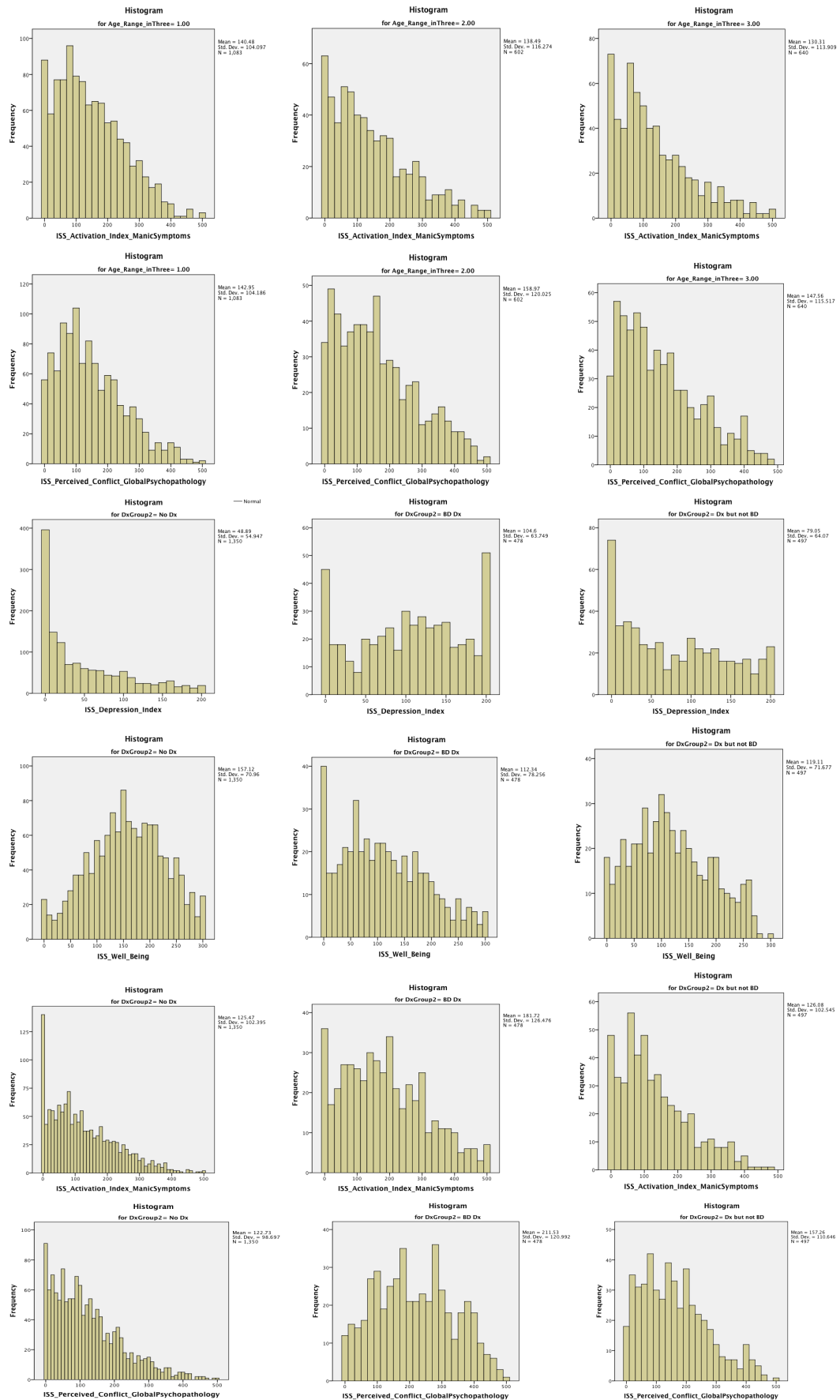
The Relationships Scale Questionnaire Normality Histograms



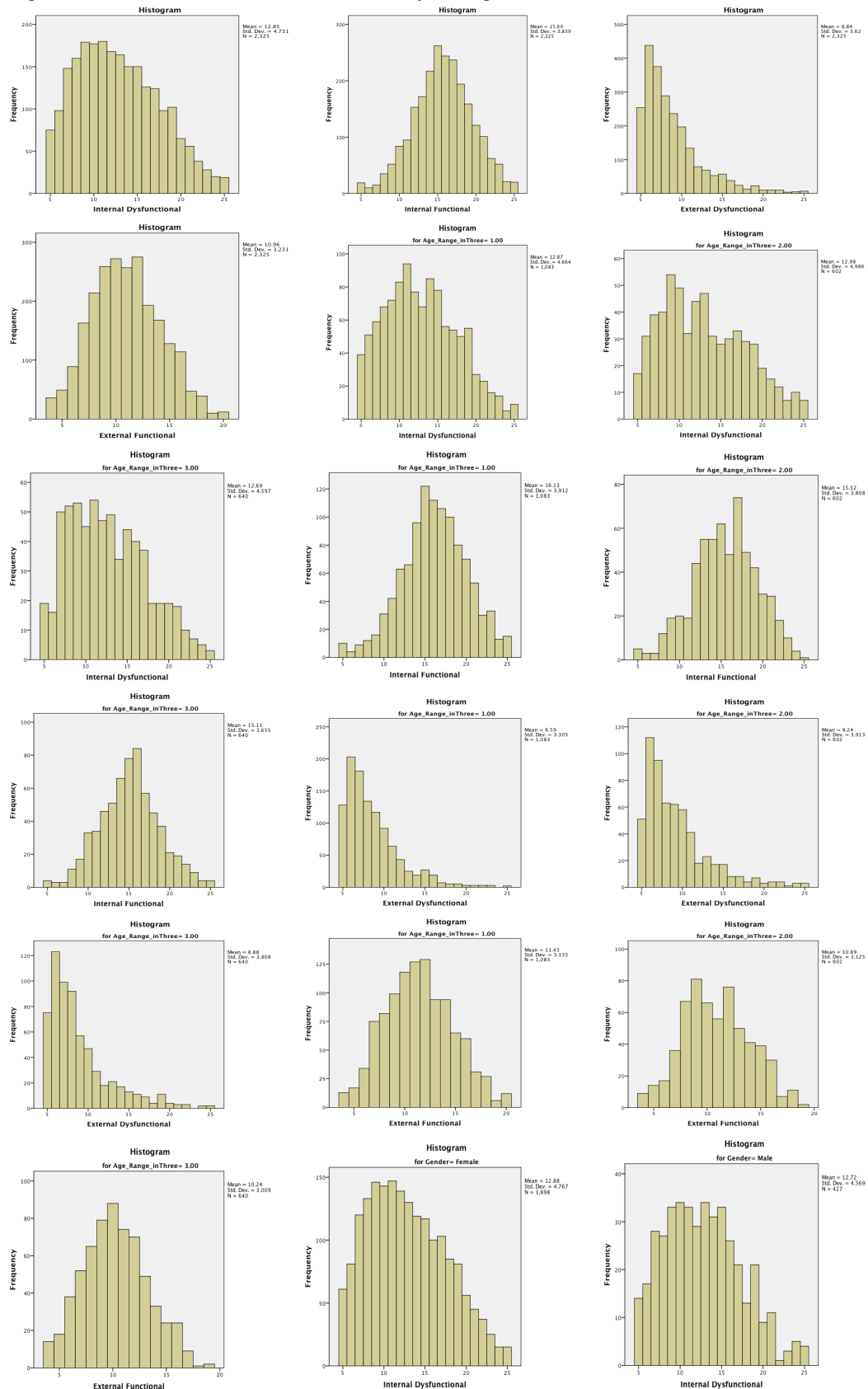


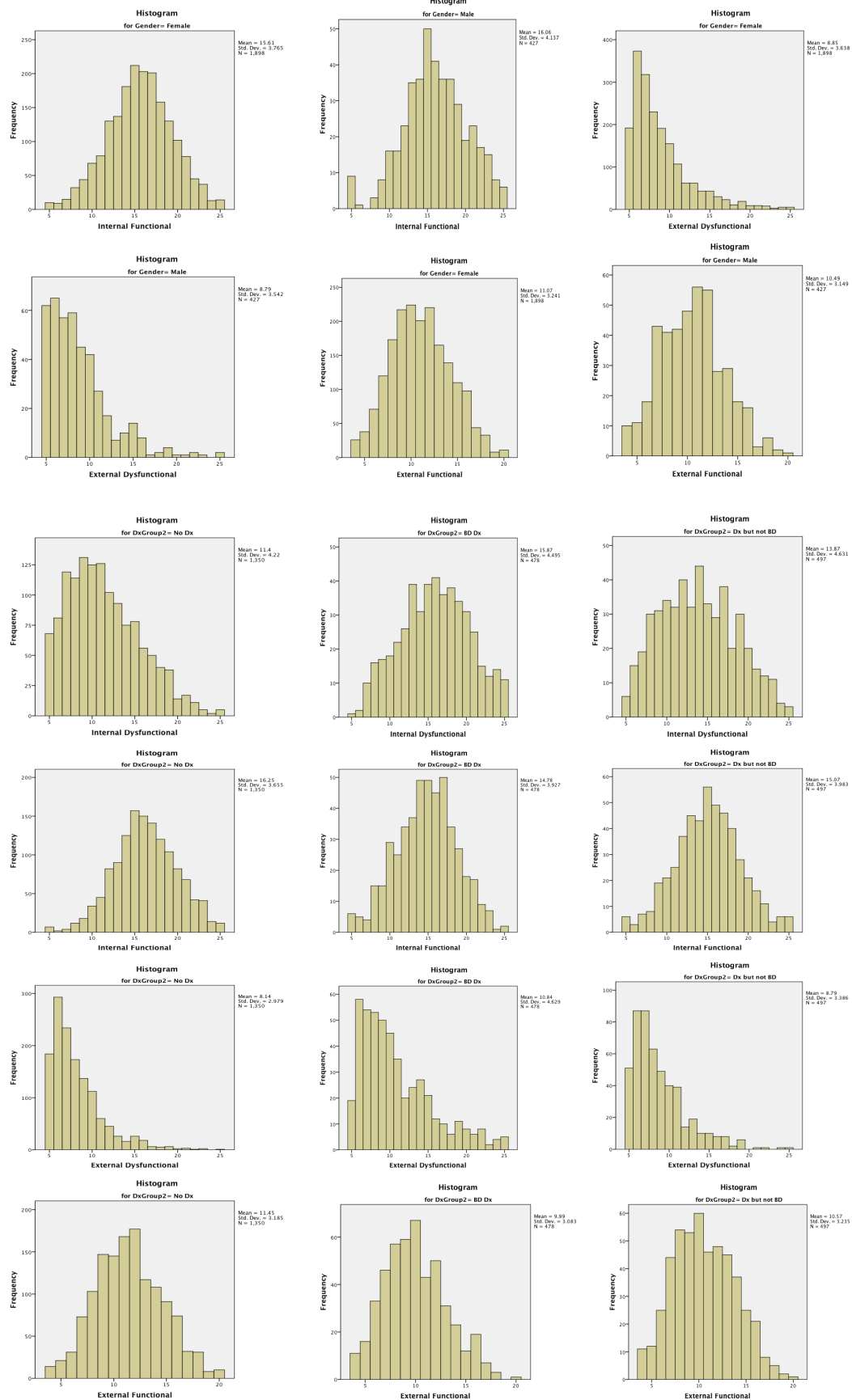
Internal State Scale Normality Histograms



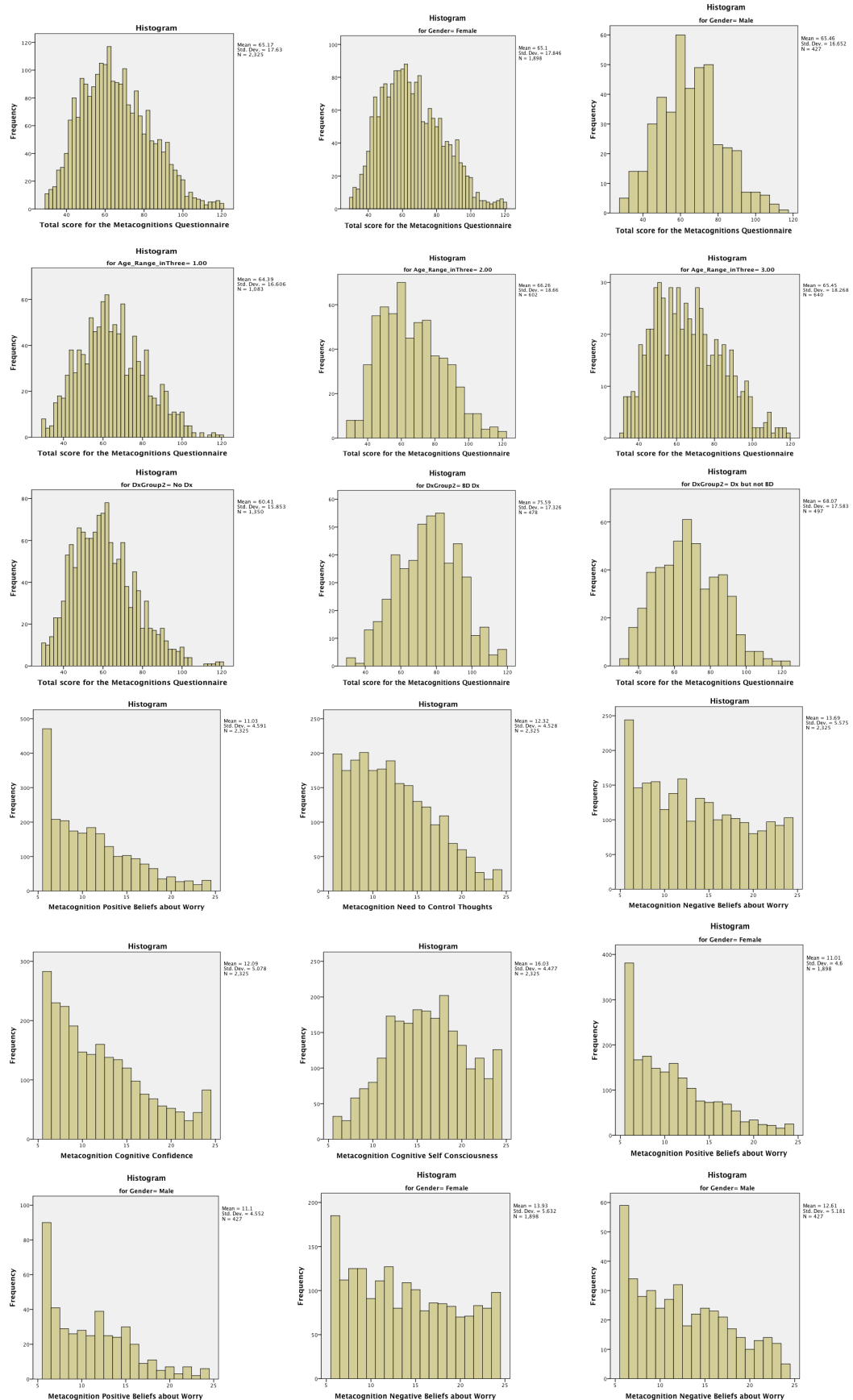


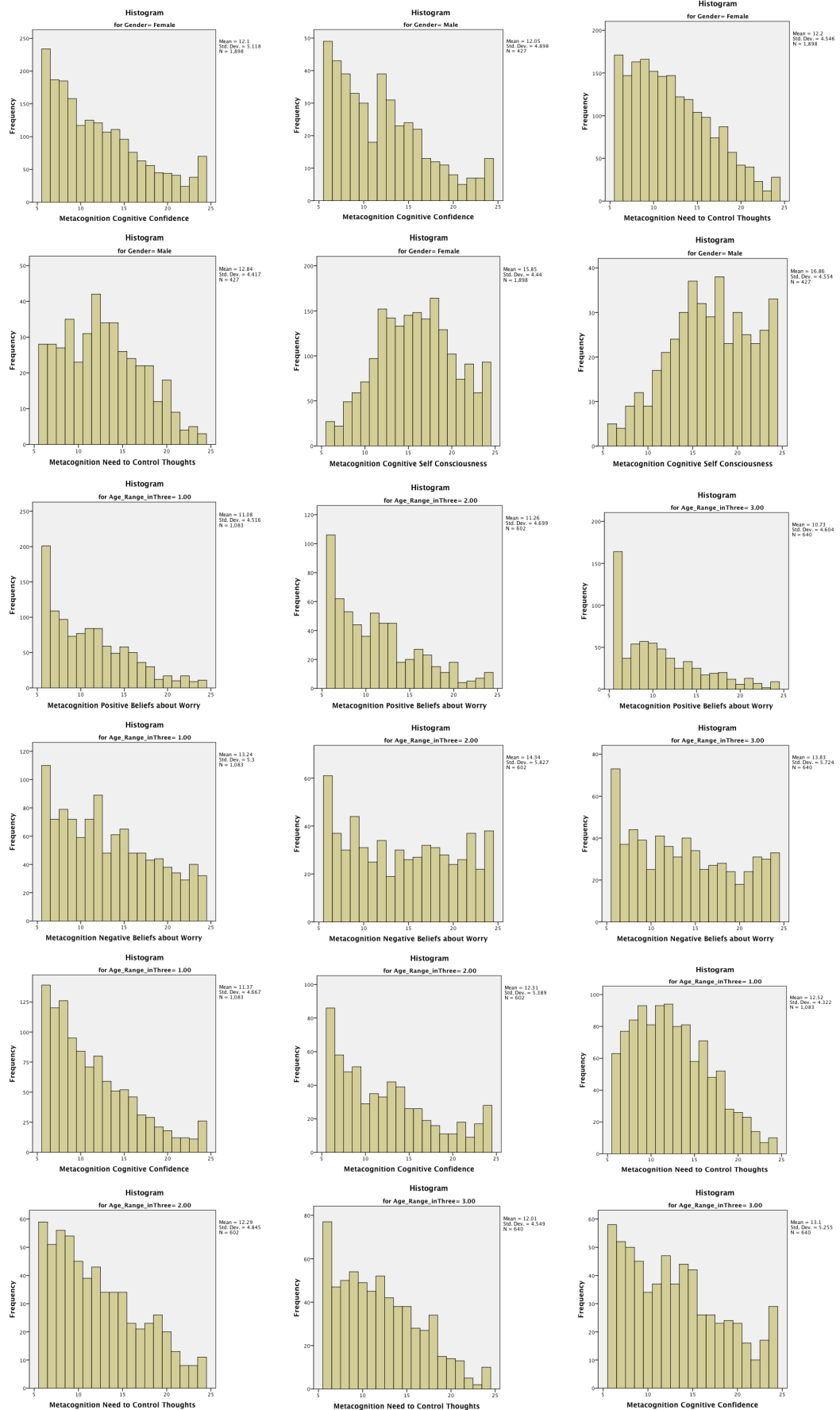
Regulation of Emotion Questionnaire Normality Histograms

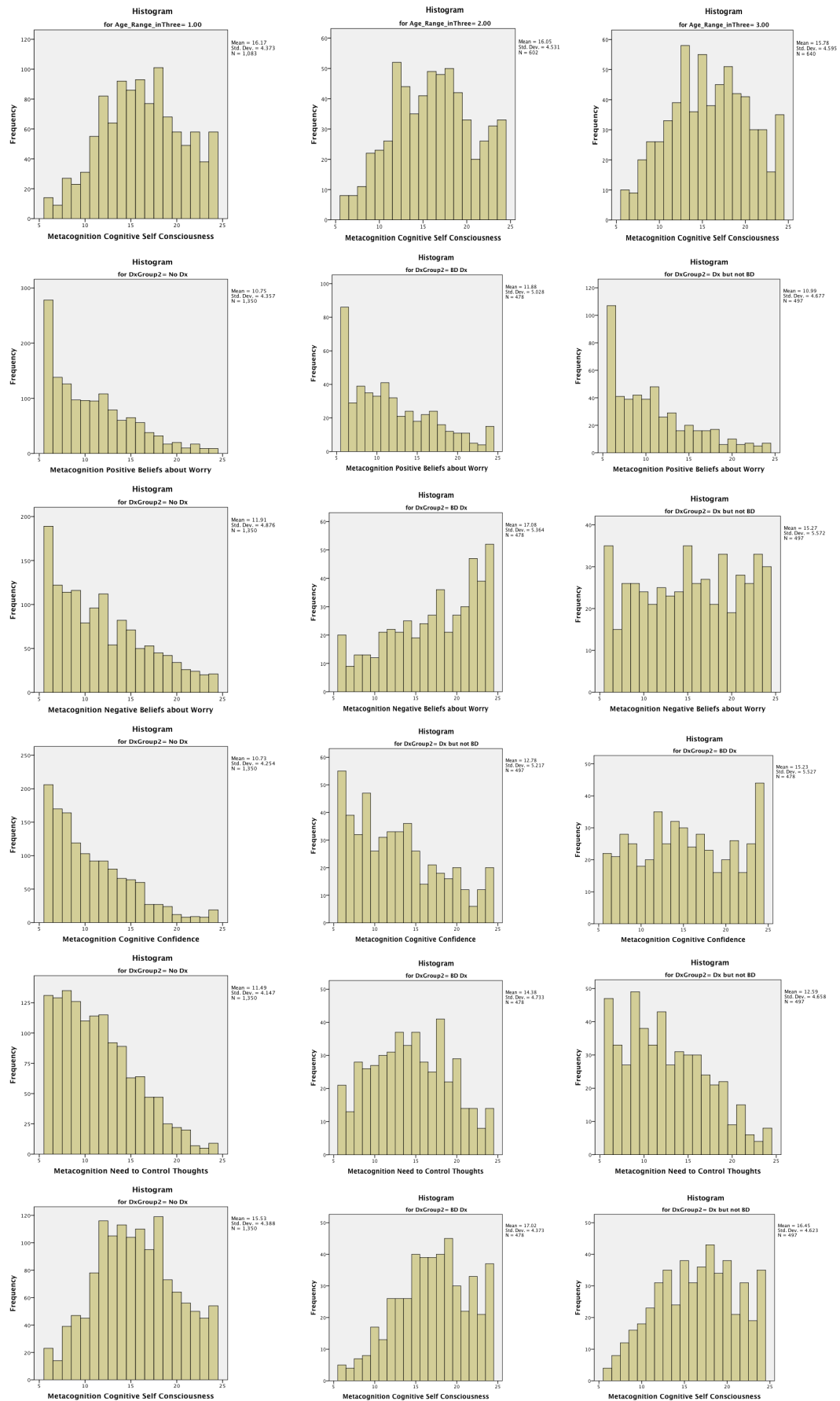




The Metacognitions Questionnaire Normality Histograms







Appendix 10 – Measures

Pilot study measures: Adult Attachment Interview (AAI) and the AAI 6 demand questions highlighted in this protocol which were asked online, along with the MCQ-30 which is included in the Main study measures section below)

ADULT ATTACHMENT INTERVIEW PROTOCOL

Mary B. Main

Introduction

I'm going to be interviewing you about your childhood experiences, and how those experiences may have affected your adult personality. So, I'd like to ask you about your early relationship with your family, and what you think about the way it might have affected you. We'll focus mainly on your childhood, but later we'll get on to your adolescence and then to what's going on right now. This interview often takes about an hour, but it could be anywhere between 45 minutes and an hour and a half.

- 1. Could you start by helping me get oriented to your early family situation, and where you lived and so on? If you could tell me where you were born, whether you moved around much, what your family did at various times for a living?*

This question is used for orientation to the family constellation, and for warm-up purposes. The research participant must not be allowed to begin discussing the quality of relationships here, so the "atmosphere" set by the interviewer is that a brief list of "who, when" is being sought, and no more than two or three minutes at most should be used for this question. The atmosphere is one of briefly collecting demographics.

In the case of participants raised by several persons, and not necessarily raised by the biological or adoptive parents (frequent in high-risk samples), the opening question above may be *"Who would you say raised you?"*: The interviewer will use this to help determine who should be considered the primary attachment figure (s) on whom the interview will focus.

Did you see much of your grandparents when you were little? If participant indicates that grandparents died during his or her own lifetime, ask the participant's age at the time of each loss. If there were grandparents whom she or he never met, ask whether this (these) grandparents had died before she was born. If yes, continue as follows: Your mother's father died before you were born? How old was she at the time, do you know? In a casual and spontaneous way, inviting only a very brief reply, the interviewer then asks, Did she tell you much about this grandfather?

Did you have brothers and sisters living in the house, or anybody besides your parents? Are they living nearby now or do they live elsewhere?

- 2. I'd like you to try to describe your relationship with your parents as a young child if you could start from as far back as you can remember?*

Encourage participants to try to begin by remembering very early. Many say they cannot remember early childhood, but you should shape the questions such that they focus at first around age five or earlier, and gently remind the research participant from time to time that if possible, you would like her to think back to this age period.

Admittedly, this is leaping right into it, and the participant may stumble. If necessary, indicate in some way that experiencing some difficulty in initially attempting to respond to this question is natural, but indicate by some silence that you would nonetheless like the participant to attempt a general description.

- 3. Now I'd like to ask you to choose five adjectives or words that reflect your relationship with your mother starting from as far back as you can remember in early childhood—as early as you can go, but say, age 5 to 12 is fine. I know this may take a bit of time, so go ahead and think for a minute...then I'd like to ask you why you chose them. I'll write each one down as you give them to me.*

Not all participants will be able to think of five adjectives right away. Be sure to make the word *relationship* clear enough to be heard in this sentence. Some participants do use "relationship" adjectives to describe the parent, but some just describe the parent herself —e.g., "pretty"... "efficient manager"—as though they had only been asked to "pick adjectives to describe your mother". These individual differences are of interest only if the participant has heard the phrase, "that reflect your childhood *relationship*" with your mother. The word should be spoken clearly, but with only slight stress or emphasis.

Some participants will not know what you mean by the term *adjectives*, which is why we phrase the question as "adjectives or words". If the participant has further questions, you can explain, "just words or phrases that would describe or tell me about your relationship with your (mother) during childhood".

The probes provided below are intended to follow the entire set of adjectives, and *the interviewer must not begin to probe until the full set of adjectives has been given*. Be patient in waiting for the participant to arrive at five adjectives, and be encouraging. This task has proven very helpful both in starting an interview, and in later interview analysis. It helps some participants to continue to focus upon the relationship when otherwise they would not be able to come up with spontaneous comments.

If for some reason a subject does not understand what a memory is, you might suggest they think of it like an image they have in their mind similar to a videotape of something which happened when they were young. Make certain that the subject really does not understand the question first, however. The great majority who may seem not to understand it are simply unable to provide a memory or incident.

The participant's ability (or inability) to provide both an overview of the relationship and specific memories supporting that overview forms one of the most critical bases of interview analysis. For this reason it is important for the interviewer to press enough in the effort to obtain the five "overview" adjectives that if a full set is not provided, she or he is reasonably certain that they truly cannot be given.

The interviewer's manner should indicate that waiting as long as a minute is not unusual, and that trying to come up with these words can be difficult. Often, participants indicate by their non-verbal behavior that they are actively thinking through or refining their choices. In this case an interested silence is warranted. Don't, however, repeatedly leave the participant in embarrassing silences for very long periods. Some research participants may tell you that this is a hard job, and you can readily acknowledge this. If the participant has extreme difficulty coming up with more than one or two words or adjectives, after a period of two to three minutes of supported attempts ("Mm... I know it can be hard ...this is a pretty tough question... Just take a little more time"), then say something like "Well, that's fine. Thank you, we'll just go with the ones you've already given me." The interviewer's tone here should make it clear that the participant's response is perfectly acceptable and not uncommon.

Okay, now let me go through some more questions about your description of your childhood relationship with your mother. You say your relationships with her was (you used the phrase) Are there any memories or incidents that come to mind with respect to (word)

The same questions will be asked *separately* for each adjective in series. Having gone through the probes which follow upon this question (below), the interviewer moves on to seek illustration for each of the succeeding adjectives in turn:

You described your childhood relationship with your mother as (or, 'your second adjective was', or 'the second word you used was'). Can you think of a memory or an incident that would illustrate why you chose to describe the relationship?

The interviewer continues, as naturally as possible, through each phrase or adjective chosen by the participant, until all five adjectives or phrases are covered. A specific supportive memory or expansion and illustration is requested for each of the adjectives, separately. In terms of time to answer, this is usually the longest question. Obviously, some adjectives chosen may be almost identical, e.g., "loving ... caring". Nonetheless, if they have been given to you as separate descriptors, you must treat each separately, and ask for memories for each.

While participants sometimes readily provide a well-elaborated incident for a particular word they have chosen, at other times they may fall silent; or "illustrate" one adjective with another ("loving ...um, because she was generous"); or describe what usually happened--i.e., offer a "scripted" memory--rather than describing specific incidents. There are a set series of responses available for these contingencies, and it is vital to memorize them.

If the participant is silent, the interviewer waits an appropriate length of time. If the participant indicates non-verbally that she or he is actively thinking, remembering or simply attempting to come up with a particularly telling illustration, the interviewer maintains an interested silence. If the silence continues and seems to indicate that the participant is feeling stumped, the interviewer says something like, "well, just take another minute and see if anything comes to mind". If following another waiting period the participant still cannot respond to the question, treat this in a casual, matter of fact manner and say "well, that's fine, let's take the next one, then". Most participants do come up with a response eventually, however, and the nature of the response then determines which of the follow-up probes are utilized.

If the participant re-defines an adjective with a second adjective as, "Loving ---she was generous", the interviewer probes by repeating the original adjective (loving) rather than permitting the participant to lead them to use the second one (generous). In other words, the interviewer in this case will say, "Well, can you think of a specific memory that would illustrate how your relationship was loving?" The interviewer should be careful,

however, not to be too explicit in their intention to lead the participant back to their original word usage. If the speaker continues to discuss "generous" after having been probed about loving once more, this violation of the discourse task is meaningful and must be allowed. As above, the nature of the participant's response determines which follow-up probes are utilized.

If a specific and well-elaborated incident is given, the participant has responded satisfactorily to the task, and the interviewer should indicate that she or he understands that. However, the interviewer should briefly show continuing interest by asking whether the participant can think of a second incident.

- If one specific but poorly elaborated incident is given, the interviewer probes for a second. Again, the interviewer does this in a manner emphasizing his or her own interest.
- If as a first response the participant gives a "scripted" or "general" memory, as "Loving. She always took us to the park and on picnics. She was really good on holidays" or "Loving. He taught me to ride a bike"—the interviewer says, "Well, that's a good general description, but I'm wondering if there was a particular time that happened, that made you think about it as loving?"
- If the participant does now offer a specific memory, briefly seek a second memory, as above. If another scripted memory is offered instead, or if the participant responds "I just think that was a loving thing to do", the interviewer should be accepting, and go on to the next adjective. Here as elsewhere the interviewer's behavior indicates that the participant's response is satisfactory.

4. Now I'd like to ask you to choose five adjectives or words that reflect your childhood relationship with your father, again starting from as far back as you can remember in early childhood—as early as you can go, but again say, age 5 to 12 is fine. I know this may take a bit of time, so go ahead and think again for a minute...then I'd like to ask you why you chose them. I'll write each one down as you give them to me. (Interviewer repeats with probes as above).

5. Now I wonder if you could tell me, to which parent did you feel the closest, and why? Why isn't there this feeling with the other parent?

By the time you are through with the above set of questions, the answer to this one may be obvious, and you may want to remark on that ("You've already discussed this a bit, but I'd like to ask about it briefly anyway..."). Furthermore, while the answer to this question may indeed be obvious for many participants, some—particularly those who describe both parents as loving—may be able to use it to reflect further on the difference in these two relationships.

6. When you were upset as a child, what would you do?

This is a critical question in the interview, and variations in the interpretation of this question are important. Consequently, the participant is first encouraged to think up her own interpretations of "upset", with the interviewer pausing quietly to indicate that the question is completed, and that an answer is requested.

Once the participant has completed her own interpretation of the question, giving a first answer, begin on the following probes. Be sure to get expansions of every answer. If the participant states, for example, "I withdrew", probe to understand what this research participant means by "withdrew". For example, you might say, "And what would you do when you withdrew?"

The interviewer now goes on to ask the specific follow-up questions below. These questions may appear similar, but they vary in critical ways, so the interviewer must make sure that the participant thinks through each question separately. This is done by placing vocal stress on the changing contexts (as we have indicated by underlining).

—When you were Upset emotionally when you were little, what would you do? (Wait for participant's reply). Can you think of a specific time that happened?

—Can you remember what would happen when you were hurt, physically? (Wait for participant's reply). Again, do any specific incidents (or, do any other incidents) come to mind?

—Were you ever M when you were little? (Wait for participant's reply). Do you remember what would happen?

When the participant describes going to a parent, see first what details they can give you spontaneously. Try to get a sense of how the parent or parents responded, and then when and if it seems appropriate you can briefly ask one or two clarifying questions.

Be sure to get expansions of every answer. Again, if the participant says "I withdrew", for example, probe to see what the participant means by this, i.e., what exactly she or he did, or how exactly they felt, and if they can elaborate on the topic.

If the participant has not spontaneously mentioned being held by the parent in response to any of the above questions, the interviewer can ask casually at the conclusion to the series, "*I was just wondering, do you remember being held by either of your parents at any of these times—I mean, when you were upset, or hurt, or ill?*"

In earlier editions of these guidelines, we suggested that if the participant answers primarily in terms of responses by one of the parents, the interviewer should go through the above queries again with respect to the remaining parent. This can take a long time and distract from the recommended pacing of the interview. Consequently, it is no longer required.

What is the first time you remember being separated from your parents?

--How did you respond? Do you remember how your parents responded?

--Are there any other separations that stand out in your mind?

Here research participants often describe first going off to nursery school, or to primary school, or going camping.

In this context, participants sometimes spontaneously compare their own responses to those of other children. This provides important information regarding the participant's own overall attitude towards attachment, so be careful not to cut any such descriptions or comparisons short.

8. Did you ever feel rejected as a young child? Of course, looking back on it now, you may realize it wasn't really rejection, but what I'm trying to ask about here is whether you remember ever having rejected in childhood

---How old were you when you first felt this way, and what did you do?

---Why do you think your parent did those things--do you think he/she realized he/she was rejecting you?

Interviewer may want to add a probe by refraining the question here, especially if no examples are forthcoming. The probe we suggest here is, *Did you ever feel pushed away or ignored?*

Many participants tend to avoid this in terms of a positive answer.

So, were you ever frightened or worried as a child?

Let the research participant respond "freely" to this question, defining the meaning for themselves. They may ask you what the question means, and if so, simply respond by saying "It's just a more general question". Do not probe heavily here. If the research participant has had traumatic experiences which they elect not to describe, or which they have difficulty remembering or thinking about, you should not insist upon hearing about them. They will have a second, brief opportunity to discuss such topics later.

9. Were your parents ever threatening with you in any way - maybe for discipline, or even jokingly?

---Some people have told us for example that their parents would threaten to leave them or send them away from home.

---(Note to researchers). In particular communities, some specific kind of punishment not generally considered fully abusive is common, such as "the silent treatment", or "shaming", etc. One question regarding this one selected specific form of punishment can be inserted here, as for example, 'Some people have told us that their parents would use the silent treatment---did this ever happen with your

parents?': The question should then be treated exactly as threatening to send away from home, i.e., the participant is free to answer and expand on the topic if she or he wishes, but there are no specific probes. The researcher should not ask about more than one such specific (community) form of punishment, since queries regarding more than one common type will lead the topic away from its more general intent (below).

Some people have memories of threats or of some kind of behavior that was abusive.

---Did anything like this ever happen to you, or in your family?

---How old were you at the time? Did it happen frequently?

---Do you feel this experience affects you now as an adult?

---Does it influence your approach to your own child?

---Did you have any such experiences involving people outside your family?

If the participant indicates that something like this did happen outside the family, take the participant through the same probes (*age? frequency? affects you now as an adult? Influences your approach to your own child?*). Be careful with this question, however, as it is clinically sensitive, and by now you may have been asking the participant difficult questions for an extended period of time.

Many participants simply answer "no" to these questions. Some, however, describe abuse and may some suffer distress in the memory. When the participant is willing to discuss experiences of this kind, the interviewer must be ready to maintain a respectful silence, or to offer active sympathy, or to do whatever may be required to recognize and insofar as possible to help alleviate the distress arising with such memories.

If the interviewer suspects that abuse or other traumatic experiences occurred, it is important to attempt to ascertain the specific details of these events insofar as possible. In the coding and classification system which accompanies this interview, *distressing experiences cannot be scored for Unresolved /disorganized responses unless the researcher is able to establish that abuse (as opposed to just heavy spanking, or light hitting with a spoon that was not frightening) occurred.*

Where the nature of a potentially physically abusive (belting, whipping, or hitting) experience is ambiguous, then, the interviewer should try to establish the nature of the experience in a light, matter-of-fact manner, without excessive prodding. If, for example, the participant says "I got the belt" and stops, the interviewer asks, "And what did getting the belt mean?". After encouraging as much spontaneous expansion as possible, the interviewer may still need to ask, again in a matter-of-fact tone, how the participant responded or felt at the time. "Getting the belt" *in itself* will not qualify as abuse within the adult attachment scoring and classification systems, since in some households and communities this is a common, systematically but not harshly imposed experience. Being belted heavily enough to overwhelmingly frighten the child for her physical welfare at the time, being belted heavily enough to cause lingering pain, and/or being belted heavily enough to leave welts or bruises will qualify.

In the case of sexual abuse as opposed to battering, the interviewer will seldom need to press for details, and should be very careful to follow the participant's lead. Whereas on most occasions in which a participant describes themselves as sexually abused the interviewer and transcript judge will have little need to probe further, occasionally a remark is ambiguous enough to require at least mild elaboration. If, for example, the participant states 'and I just thought he could be pretty sexually abusive', the interviewer will ideally follow-up with a query such as, 'well, could you tell me a little about what was happening to make you see him as sexually abusive?'. Should the participant reply that the parent repeatedly told off-color jokes in her company, or made unwelcome remarks about her attractiveness, the parent's behavior, though insensitive, will not qualify as sexually

abusive within the accompanying coding system. Before seeking elaboration of any kind, however, the interviewer should endeavor to determine whether the participant seems comfortable in discussing the incident or incidents.

All querying regarding abuse incidents must be conducted in a matter-of-fact, professional manner. The interviewer must use good judgment in deciding whether to bring querying to a close if the participant is becoming uncomfortable. At the same time, the interviewer *must not avoid the topic or give the participant the impression that discussion of such experiences is unusual*. Interviewers sometimes involuntarily close the topic of abuse experiences and their effects, in part as a well-intentioned and protective response towards participants who in point of fact would have found the discussion welcome.

Participants who seem to be either thinking about or revealing abuse experiences for the first time-- "No, nothing...no... well, I, I haven't thought, remembered this for, oh, years, but...maybe they used to... tie me..."-- must be handled with special care, and should not be probed unless they clearly and actively seem to want to discuss the topic. If you sense that the participant has told you things they have not previously discussed or remembered, special care must be taken at the end of the interview to ensure that the participant does not still suffer distress, and feels able to contact the interviewer or project director should feelings of distress arise in the future.

In such cases the participant's welfare must be placed above that of the researcher. While matter-of-fact, professional and tactful handling of abuse-related questions usually makes it possible to obtain sufficient information for scoring, the interviewer must be alert to indications of marked distress, and ready to tactfully abandon this line of questioning where necessary. Where the complete sequence of probes must be abandoned, the interviewer should move gracefully and smoothly to the next question, as though the participant had in fact answered fully.

10. In general, how do you think your overall experiences with your parents have affected your adult personality?

The interviewer should pause to indicate she or he expects the participant to be thoughtful regarding this question, and is aware that answering may require some time.

Are there any aspects to your early experiences that you feel were a set-back in your development?

In some cases, the participant will already have discussed this question. Indicate, as usual, that you would just like some verbal response again anyway, "for the record".

It is quite important to know whether or not a participant sees their experiences as having had a negative effect on them, so the interviewer will follow-up with one of the two probes provided directly below. The interviewer must stay alert to the participant's exact response to the question, since the phrasing of the probe differs according to the participant's original response.

If the participant has named one or two setbacks, the follow-up probe used is:

—Are there any other aspects of your early experiences, that you think might have held your development back, or had a negative effect on the way you turned out?

If the participant has understood the question, but has not considered anything about early experiences a setback, the follow-up probe used is:

—Is there anything about your early experiences that you think might have held your development back, or had a negative effect on the way you turned out?

Although the word *anything* receives some vocal stress, the interviewer must be careful not to seem to be expressing impatience with the participant's previous answer. The stress simply implies that the participant is being given another chance to think of something else she or he might have forgotten a moment ago.

RE: PARTICIPANTS WHO DON'T SEEM TO UNDERSTAND THE TERM, SETBACK. A few participants aren't familiar with the term, *set-back*. If after a considerable wait for the participant to reflect, the participant seems simply puzzled by the question, the interviewer says,

"Well, not everybody uses terms like set-back for what I mean here. I mean, was there anything about your early experiences, or any parts of your early experiences, that you think might have held your development back, or had a negative effect on the way you turned out?"

In this case, this becomes the main question, and the probe becomes

—Is there anything else about your early experiences that you think might have held your development back, or had a negative effect on the way you turned out?

11. Why do you think your parents behaved as they did during your childhood?

This question is relevant even if the participant feels childhood experiences were entirely positive. For participants reporting negative experiences, this question is particularly important.

12. Were there any other adults with whom you were close, like parents, as a child?

— Or any other adults who were especially important to you, even though not parental?

Give the participant time to reflect on this question. This is the point at which some participants will mention housekeepers, au pairs, or nannies, and some will mention other family members, teachers, or neighbors.

Be sure to find out ages at which these persons were close with the participant, whether they had lived with the family, and whether they had had any caregiving responsibilities. In general, attempt to determine the significance and nature of the relationship.

13. Did you experience the loss of a parent or other close loved one while you were a young child—for example, a sibling, or a close family member?

(A few participants understand the term "loss" to cover brief or long-term separations from living persons, as, "I lost my mom when she moved South to stay with her mother". If necessary, clarify that you are referring to death only, i.e. specifically to loved ones who had died).

—Could you tell me about the circumstances, and how old you were at the time?

—How did you respond at the time?

—Was this death sudden or was it expected?

—Can you recall your feelings at that time?

—Have your feelings regarding this death changed much over time?

If not volunteered earlier. *Did you attend the funeral, and what was this like for you?*

If loss of a parent or sibling. *What would you say was the effect on your (other parent) and on your household, and how did this change over the years?*

-----Would you say this loss has had an effect on your adult personality?

-----Were relevant How does it affect your approach to your own child?

13a. Did you lose any other important persons during your childhood?
(Same queries--again, this refers to people who have died rather than separation experiences).

13b. Have you lost other close persons, in adult years? (Same queries).

Be sure that the response to these questions covers loss of any siblings, whether older or younger, loss of grandparents, and loss of any person who seemed a "substitute parent" or who lived with the family for a time. Some individuals will have been deeply affected by.

Probe any loss which seems important to the participant, including loss of friends, distant relatives, and neighbors or neighbor's children. Rarely, the research participant will seem distressed by the death of someone who they did not personally know (often, a person in the family, but sometimes someone as removed as the friend of a friend).

If a participant brings up the suicide of a friend of a friend and seems distressed by it, the loss *should be fully* probed. The interviewer should be aware, then, that speakers may be assigned to the unresolved/disorganized adult attachment classification as readily for lapses in monitoring occurring during the discussion of the death of a neighbor's child *experienced during the adult years* as for loss of a parent in childhood.

Interviewing research participants regarding loss obviously requires good clinical judgment. At maximum, only four to five losses are usually fully probed. In the case of older research participants or those with traumatic histories, there may be many losses, and the interviewer will have to decide on the spot which losses to probe. No hard and fast rules can be laid out for determining which losses to skip, and the interviewer must to the best of his or her ability determine which losses--if there are many--are in fact of personal significance to the participant. Roughly, in the case of a participant who has lost both parents, spouse, and many other friends and relatives by the time of the interview, the interviewer might elect to probe the loss of the parents, the spouse, and "any other loss which you feel may have been especially important to you". If, however, these queries seem to be becoming wearying or distressing for the participant, the interviewer should acknowledge the excessive length of the querying, and offer to cut it short.

14. Other than any difficult experiences you've already described, have you had any other experiences which you should regard as potentially traumatic?

Let the participant free-associate to this question, then clarify if necessary with a phrase such as, *I mean, any experience which was overwhelmingly and immediately terrifying.*

This question is a recent addition to the interview. It permits participants to bring up experiences which may otherwise be missed, such as scenes of violence which they have observed, war experiences, violent separation, or rape.

Some researchers may elect not to use this question, since it is new to the 1996 protocol. If you do elect to use it, it must of course be used with all subjects in a given study.

The advantage of adding this question is that it may reveal lapses in reasoning or discourse specific to traumatic experiences other than loss or abuse.

Be very careful, however, not to permit this question to open up the interview to all stressful, sad, lonely or up-setting experiences which may have occurred in the subject's lifetime, or the purpose of the interview and of the question may be diverted. It will help if your tone indicates that these are rare experiences.

Follow up on such experiences with probes only where the participant seems at relative ease in discussing the event, and/or seems clearly to have discussed and thought about it before.

Answers to this question will be varied. Consequently, exact follow-up probes cannot be given in advance, although the probes succeeding the abuse and loss questions may serve as a partial guide. In general, the same cautions should be taken with respect to this question as with respect to queries regarding frightening or worrisome incidents in childhood, and experiences of physical or sexual abuse. Many researchers may elect to treat this question lightly, since the interview is coming to a close and it is not desirable to leave the participant reviewing too many difficult experiences just prior to leave taking.

15. Now I'd like to ask you a few more questions about your relationship with your parents. Were there many changes in your relationship with your parents (or remaining parent) after childhood? We'll get to the present in a moment, but right now I mean changes occurring roughly between your childhood and your adulthood?

Here we are in part trying to find out, *indirectly* (1) whether there has been a period of rebellion from the parents, and (2) also indirectly, whether the participant may have rethought early unfortunate relationships and "forgiven" the parents. Do not ask anything about forgiveness directly, however--this will need to come up spontaneously. This question also gives the participant the chance to describe any changes in the parents behavior, favorable or unfavorable, which occurred at that time.

16. *Now I'd like to ask you, what is your relationship with your parents (or remaining parent) like for you now as an adult? Here I am asking about your current relationship.*

---Do you have much contact with your parents at present?
 ---What would you say the relationship with your parents is like currently?
 ---Could you tell me about any (or any other) sources of dissatisfaction in your current relationship with your parents? any special (or any other) sources of special satisfaction?

This has become a critical question within the Adult Attachment Interview, since a few participants who had taken a positive stance towards their parents earlier suddenly take a negative stance when asked to describe current relationships. As always, the interviewer should express a genuine interest in the participant's response to this question, with sufficient pause to indicate that a reflective response is welcome.

17. *I'd like to move now to a different sort of question—it's not about your relationship with your parents, instead it's about an aspect of your current relationship with (specific child of special interest to the researcher, or all the participant's children considered together). How do you respond now, in terms of feelings, when you separate from your child / children? (For adolescents or individuals without children, see below).*

Ask this question exactly as it is, without elaboration, and be sure to give the participant enough time to respond. Participants may respond in terms of leaving child at school, leaving child for vacations, etc., and this is encouraged. What we want here are the participant's feelings about the separation. This question has been very helpful in interview analysis, for two reasons. In some cases it highlights a kind of role-reversal between parents and child, i.e., the participant may in fact respond as though it were the child who was leaving the parent alone, as though the parent was the child. In other cases, the research participant may speak of a fear of loss of the child, or a fear of death in general. When you are certain you have given enough time (or repeated or clarified the question enough) for the participant's naturally-occurring response, then (and only then) add the following probe:

---Do you ever feel worried about (child)?

For individuals without children, you will pose this question as a hypothetical one, and continue through the remaining questions in the same manner. For example, you can say, now I'd like you to imagine that you have a one-year-old child, and I wonder how you think you might respond, in terms of feelings, if you had to separate from this child? "Do you think you would ever feel worried about this child?"

18. *If you had three wishes for your child twenty years from now, what would they be? I'm thinking partly of the kind of future you would like to see for your child I'll give you a minute or two to think about this one.*

This question is primarily intended to help the participant begin to look to the future, and to lift any negative mood which previous questions may have imposed.

For individuals without children, you again pose this question in hypothetical terms. For example, you can say, "Now I'd like you to continue to imagine that you have a one-year-old child for just another minute. This time, I'd like to ask, if you had three wishes for your child twenty years from now, what would they be? I'm thinking partly of the kind of future you would like to see for your imagined child I'll give you a minute or two to think about this one".

19. *Is there any particular thing which you feel you learned above all from your own childhood experiences? I'm thinking here of something you feel you might have gained from the kind of childhood you had.*

Give the participant plenty of time to respond to this question. Like the previous and succeeding questions, it is intended to help integrate whatever untoward events or feelings he or she has experienced or remembered within this interview, and to bring the interview down to a light close.

20. *We've been focusing a lot on the past in this interview, but I'd like to end up looking quite a ways into the future. We've just talked about what you think you may have learned from your own childhood experiences. I'd like to end by asking you what would you hope your child (or, your imagined child) might have learned from his/her experiences of being parented by you?*

The interviewer now begins helping the participant to turn his or her attention to other topics and tasks. Participants are given a contact number for the interviewer and/or project director, and encouraged to feel free to call if they have any questions.

Main study measures:

Hypomanic personality Scale (HPS)

This questionnaire consists of statements to which you can respond true or false. In each case, please record your answer by choosing the appropriate response.

Please remember there are no right or wrong answers.

	True	False
1. I seem to have an uncommon ability to persuade and inspire others.	<input type="radio"/>	<input type="radio"/>
2. I often get into moods where I feel like many of the rules of life don't apply to me.	<input type="radio"/>	<input type="radio"/>
3. Sometimes ideas and insights come to me so fast that I cannot express them all.	<input type="radio"/>	<input type="radio"/>
4. I seem to be a person whose mood goes up and down easily.	<input type="radio"/>	<input type="radio"/>
5. There are often times when I am so restless that it is impossible for me to sit still.	<input type="radio"/>	<input type="radio"/>
6. I often feel excited and happy for no apparent reason.	<input type="radio"/>	<input type="radio"/>
7. I often have moods where I feel so energetic and optimistic that I feel I could outperform almost anyone at anything.	<input type="radio"/>	<input type="radio"/>
8. In unfamiliar surroundings I am often so assertive and sociable that I surprise myself.	<input type="radio"/>	<input type="radio"/>
9. I am frequently in such high spirits that I can't concentrate on any one thing for too long.	<input type="radio"/>	<input type="radio"/>
10. I very frequently get into moods where I wish I could be everywhere and do everything at once.	<input type="radio"/>	<input type="radio"/>
11. A hundred years after I'm dead, my achievements will probably have been forgotten.	<input type="radio"/>	<input type="radio"/>
12. I am so good at controlling others that sometimes it scares me.	<input type="radio"/>	<input type="radio"/>
13. I am usually in an average sort of mood, not too high and not too low.	<input type="radio"/>	<input type="radio"/>
14. I do most of my best work during brief periods of intense inspiration.	<input type="radio"/>	<input type="radio"/>
15. I am considered to be a kind of "hyper" person.	<input type="radio"/>	<input type="radio"/>
16. Many people would consider me to be amusing but kind of eccentric.	<input type="radio"/>	<input type="radio"/>
17. I have often felt happy and irritable at the same time.	<input type="radio"/>	<input type="radio"/>
18. I frequently find that my thoughts are racing.	<input type="radio"/>	<input type="radio"/>
19. When I feel an emotion, I usually feel it with extreme intensity.	<input type="radio"/>	<input type="radio"/>
20. I like to have others think of me as a normal kind of person.	<input type="radio"/>	<input type="radio"/>

Internal State Scale (ISS)

For each of the following statements, please pick a number that best describes the way you have felt over the past 24 hours. While there may have been some change during that time, try to give a single summary rating for each item.

0 = Not at all/Rarely
100 = Very much so/Much of the time

	0	10	20	30	40	50	60	70	80	90	100
1. Today my mood is changeable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Today I feel irritable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Today I feel like a capable person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Today I feel like people are out to get me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Today I actually feel great inside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Today I feel impulsive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Today I feel depressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Today my thoughts are going fast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Today it seems like nothing will ever work out for me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Today I feel overactive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Today I feel as if the world is against me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Today I feel "sped up" inside	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Today I feel restless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Today I feel argumentative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Today I feel energised	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please choose a number on the scale from 0 to 100 which best describes how you have felt over the past 24 hours and type it in the box below:

0= Depressed/Down
50= Normal
100= Manic/High

Relationship Scale Questionnaire (RSQ)

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about close relationships.

Please remember there are no right or wrong answers.

	Not like me at all	Not like me	Somewhat like me	Like me	Very much like me
1. I find it difficult to depend on other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. It is very important to me to feel independent.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I find it easy to get emotionally close to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I worry that I will be hurt if I allow myself to become too close to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I am comfortable without close emotional relationships.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I want to be completely emotionally intimate with others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I worry about being alone.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I am comfortable depending on other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I find it difficult to trust others completely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I am comfortable having other people depend on me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I worry that others don't value me as much as I value them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. It is very important to me to feel self-sufficient.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I prefer not to have other people depend on me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I am somewhat uncomfortable being close to others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I find that others are reluctant to get as close as I would like.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I prefer not to depend on others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I worry about having others not accept me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The Metacognitions Questionnaire (MCQ-30)

This questionnaire is concerned with beliefs people have about their thinking. Listed below are a number of beliefs that people have expressed. Please read each item and say how much you generally agree with it by clicking in the appropriate option.

Please remember there are no right or wrong answers.

	Do not agree	Agree slightly	Agree moderately	Agree very much
1. Worrying helps me to avoid problems in the future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My worrying is dangerous for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I think a lot about my thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I could make myself sick with worrying.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I am aware of the way my mind works when I am thinking through a problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. If I did not control a worrying thought, and then it happened, it would be my fault.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I need to worry in order to remain organized.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I have little confidence in my memory for words and names.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. My worrying thoughts persist, no matter how I try to stop them.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Worrying helps me to get things sorted out in my mind.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I cannot ignore my worrying thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I monitor my thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I should be in control of my thoughts all of the time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. My memory can mislead me at times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. My worrying could make me go mad.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I am constantly aware of my thinking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I have a poor memory.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. I pay close attention to the way my mind works.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Worrying helps me cope.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Not being able to control my thoughts is a sign of weakness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. When I start worrying, I cannot stop.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I will be punished for not controlling certain thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Worrying helps me to solve problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I have little confidence in my memory for places.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. It is bad to think certain thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. I do not trust my memory.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. If I could not control my thoughts, I would not be able to function.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I need to worry in order to work well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I have little confidence in my memory for actions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. I constantly examine my thoughts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The Beck Depression Inventory (BDI-II)

This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick one statement in each group that best describes the way you have been feeling during the past two weeks, including today.

1. Sadness

- ☐ I do not feel sad
- ☐ I feel sad much of the time
- ☐ I am sad all the time
- ☐ I am so sad or unhappy that I can't stand it

2. Pessimism

- ☐ I am not discouraged about my future
- ☐ I feel more discouraged about my future than I used to be
- ☐ I do not expect things to work out for me
- ☐ I feel my future is hopeless and will only get worse

3. Past Failure

- ☐ I do not feel like a failure
- ☐ I have failed more than I should have
- ☐ As I look back I see a lot of failures
- ☐ I feel I am a total failure as a person

4. Loss of Pleasure

- ☐ I get as much pleasure as I ever did from the things I enjoy
- ☐ I don't enjoy things as much as I used to
- ☐ I get very little pleasure from the things I used to enjoy
- ☐ I can't get any pleasure from the things I used to enjoy

5. Guilty Feelings

- ☐ I don't feel particularly guilty
- ☐ I feel guilty over many things I have done or should have done
- ☐ I feel quite guilty most of the time
- ☐ I feel guilty all of the time

6. Punishment Feelings

- ☐ I don't feel I am being punished
- ☐ I feel I may be punished
- ☐ I expect to be punished
- ☐ I feel I am being punished

7. Self-Dislike

- ☐ I feel the same about myself as ever
- ☐ I have lost confidence in myself
- ☐ I am disappointed in myself
- ☐ I dislike myself

8. Self-Criticalness

- ☐ I don't criticize or blame myself more than usual
- ☐ I am more critical of myself than I used to be
- ☐ I criticize myself for all of my faults
- ☐ I blame myself for everything bad that happens

9. Suicidal Thoughts or Wishes

- ☐ I don't have any thoughts of killing myself
- ☐ I have thoughts of killing myself, but I would not carry them out
- ☐ I would like to kill myself
- ☐ I would kill myself if I had the chance

10. Crying

- ☐ I don't cry anymore than I used to
- ☐ I cry more than I used to
- ☐ I cry over every little thing
- ☐ I feel like crying, but I can't

11. Agitation

- ☐ I am no more restless or wound up than usual
- ☐ I feel more restless or wound up than usual
- ☐ I am so restless or agitated that it is hard to stay still
- ☐ I am so restless or agitated that I have to keep moving or doing something

12. Loss of Interest

- ☐ I have not lost interest in other people or activities
- ☐ I am less interested in other people or things than before
- ☐ I have lost most of my interest in other people or things
- ☐ It's hard to get interested in anything

13. Indecisiveness

- ☐ I make decisions about as well as ever
- ☐ I find it more difficult to make decisions than usual
- ☐ I have much greater difficulty in making decisions than I used to
- ☐ I have trouble making any decisions

14. Worthlessness

- ☐ I do not feel I am worthless
- ☐ I don't consider myself as worthwhile and useful as I used to
- ☐ I feel more worthless as compared to other people
- ☐ I feel utterly worthless

15. Loss of Energy

- ☐ I have as much energy as ever
- ☐ I have less energy than I used to have
- ☐ I don't have enough energy to do very much
- ☐ I don't have enough energy to do anything

16. Irritability

- ☐ I am no more irritable than usual
- ☐ I am more irritable than usual
- ☐ I am much more irritable than usual
- ☐ I am irritable all the time

17. Concentration Difficulty

- ☐ I concentrate as well as ever
- ☐ I can't concentrate as well as usual
- ☐ It's hard to keep my mind on anything for very long
- ☐ I find I can't concentrate on anything

18. Tiredness or Fatigue

- ☐ I am no more tired or fatigued than usual
- ☐ I get more tired or fatigued more easily than usual
- ☐ I am too tired or fatigued to do a lot of the things I used to do
- ☐ I am too tired or fatigued to do most of the things I used to do

19. Changes in Sleeping Pattern

- ☐ I have not experienced any change in my sleeping pattern
- ☐ I sleep somewhat more or less than usual
- ☐ I sleep a lot more or a lot less than usual
- ☐ I sleep most of the day / I wake up 1-2 hours early and can't get back to sleep

20. Loss of Interest in Sex

- ☐ I have not noticed any recent change in my interest in sex
- ☐ I am less interested in sex than I used to be
- ☐ I am much less interested in sex now
- ☐ I have lost interest in sex completely

21. Changes in Appetite

- ☐ I have not experienced any change in my appetite
- ☐ My appetite is somewhat less or greater than usual
- ☐ My appetite is much less or much greater than usual
- ☐ I have no appetite at all / I crave food all the time

The Regulation of Emotion Questionnaire (REQ)

The following questions ask you to think about how often you do certain things in response to your emotions. You do not have to think about specific emotions but just how often you generally do these things listed below. Please tick the box corresponding to the answer that fits best.

In general how do you respond to your emotions? We all respond to our emotions in different ways so there are no right or wrong answers.

	Never	Seldom	Often	Very Often	Always
1. I talk to someone about how I feel.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I take my feelings out on others verbally (e.g. shouting, arguing).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I seek physical contact from friends or family (e.g. a hug, hold hands).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I review (rethink) my thoughts or beliefs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I harm or punish myself in some way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I do something energetic (e.g. play sport, go for a walk).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I dwell on my thoughts and feelings (e.g. it goes round and round in my head and I can't stop it).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I ask others for advice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I review (rethink) my goals or plans.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I take my feelings out on others physically (e.g. fighting, lashing out).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I put the situation into perspective.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I concentrate on a pleasant activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I try to make others feel bad (e.g. being rude, ignoring them).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I think about people better off and make myself feel worse.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I keep the feeling locked up inside.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I plan what I could do better next time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I bully other people (e.g. saying nasty things to them, hitting them).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I take my feelings out on objects around me (e.g. deliberately causing damage to my house, school or outdoor things).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Things feel unreal (e.g. I feel strange, things around me feel strange, I daydream).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The 6 AAI demand questions

The next six questions will look at the relationship with your family, your childhood experiences and how these may have affected your adult personality. Many of the questions ask multiple things. Please consider all of these in your response rather than answering each individually, and remember that there are no right or wrong answers.

1. Did you ever feel rejected as a young child? How old were you when you first felt this way, and what did you do? Why do you think your parents (or primary caregiver) did those things - do you think they realised they were rejecting you?

2. In general, how do you think your overall experiences with your parents have affected your adult personality?

3. Are there any aspects to your early experiences that you feel were a set-back in your development?

4. Why do you think your parents behaved as they did during your childhood?

5. Did you experience the loss of a parent or other close loved one while you were a young child? What were the circumstances like, and how did you respond at the time? Can you recall your feelings? Did you attend the funeral, and what was it like? Has this loss had an effect on your adult personality? If relevant, how does it affect your approach to your own child?

6. Were there many changes in your relationship with your parent(s) after childhood? Changes occurring roughly between your childhood and your adulthood?

Appendix 11 – Consent form, information sheet and demographics form used in RF pilot study

DEMOGRAPHICS FORM

<p>1. Please write down your date of birth (DD/MM/YYYY) :</p> <p style="text-align: center;">____/____/____</p>
<p>2. Gender:</p> <p><input type="checkbox"/> Female</p> <p><input type="checkbox"/> Male</p>
<p>3. E-mail address:</p> <p style="text-align: center;">_____</p>

Information Sheet:**Assessment of Reflective Functioning through an online survey**

This study has been approved by the University of Edinburgh's (UoE) School of Health in Social Science Research Ethics Committee

Name and contact details of investigator:

Sonia Madrid Cuevas
S.Madrid-Cuevas@sms.ed.ac.uk

What are the aims of the project?

We want to know if two new and shorter measures are comparable to an established one to assess Reflective Functioning.

What will be involved?

We would conduct an interview about your thoughts and feelings of your childhood experiences and family, and how those experiences may have affected your adult personality. There are no right or wrong answers so we want you to feel free to share your personal experiences. This interview would be audio-taped so we can capture an accurate record of what you have shared.

In the next few days you will get an email with the link to our online survey where you will be asked to fill in two questionnaires. The first questionnaire is concerned with the beliefs people have about their own thinking. The second questionnaire will be looking at your childhood experiences and how they may have affected your adult personality.

How long will it take?

The Interview will take 30 to 40 minutes and in the online survey there will be 36 questions in total so it should take around 25 minutes to complete.

Do I have to take part?

You should only participate if you want to; choosing not to take part will not disadvantage you in any way. You are free not to answer any questions or withdraw your involvement at any time. If you decide to take part you will be given this information sheet to keep and be asked to sign a consent form.

What happens to my data/personal information?

We will keep the audio-taped and paper material in locked cabinets at UoE. All information will be stored electronically in databases where it will be anonymised without any identifying features. All audio-taped material will only be accessed by the researchers on the study, and will be destroyed 12 months after the project begins. The data will only be used by the immediate research team who is based in the School of Health in Social Science.

Who can I contact for further information?

Before you decide whether you want to take part, it is important for you to read the following information carefully and discuss it with others if you wish. Please feel free to ask us if there is anything that is not clear or you would like more information. If you need any further information about the study, or if there are any problems, please contact the Principle Investigator Sonia Madrid Cuevas at S.Madrid-Cuevas@sms.ed.ac.uk

**Informed Consent Form:
Assessing Reflective Functioning Online**

This study has been approved by the University of Edinburgh's UoE School of Health in Social Science Research Ethics Committee

I agree that I

- have read the information sheet ☐
- have agreed to complete the necessary questionnaires ☐
- have a right to withdraw from the survey at any time ☐
- understand that all material will be strictly confidential ☐

Signed:

Date:

Investigator's Statement

I[Sonia Madrid Cuevas](#).....

confirm that I have carefully explained the purpose of the study to the participant.

Signed:

Date:

Appendix 12 - Examples on how to score and classify Reflective Functioning (RF)

RF Overall Score	Classification	Example
-1 to 0 (Negative or absent RF)	a) Rejection	<i>One subject, when asked why he thought his parents had behaved as they did, told the interviewer about how having been exposed to football early in life had developed a life-long devotion to the game.</i>
	b) Bizarre	<i>"She was a curious person, my mother, unpredictable, even odd at times. One day she cut down all the flowers in the garden ... also, she was very shy ..."</i>
1 to 2 (Lacking in RF)	a) Disavowal	<i>"I don't know. I really could not say"</i>
	b) Distorted/Self serving	<i>"They thought of little else except what was good for their son..."</i>
3 to 4 (Questionable low RF)	a) Naïve/Simplistic	<i>"All parents want the best for their children"</i>
	b) Over-analytical	<i>"Well, interesting, you should ask that ... I mean ever since the concept of maturity, you know, formed in my consciousness I have always been aware of being some distance from it..."</i>
5 to 6 (Ordinary RF)	The most common rating in a "normal" sample	<i>"I thought my mother felt resentful of us, but I'm not really sure if she felt that way herself"</i>
7 to 8 (Marked RF)	Explicit attempts at teasing out mental states	<i>"Mum would say 'Wait till your Dad comes home!' Then he would wallop us. But, you know, I think he felt obliged to do that because he knew that she had to be with us all day, he felt he had to back her up."</i>
9 (Extraordinary RF)	Exceptional sophistication and complex reasoning	<i>"I will feel guilty, and I know my ways of handling will not always be so productive. I will feel really guilty for leaving her and going to work and I will think a lot about it during the day. But I know I won't be able to stay at home for long. It's just the kind of person I am. I will need the outside stimulation as well as the money to be a good mother. If I stayed at home all the time I think I would grow resentful towards the baby. I just hope my issues don't affect her too much. I'm afraid that sometimes I'll need her more than she needs me..."</i>

Appendix 13 – Demographic questions for the main study

Psychology Test

Find out more about yourself, with this free psychology test

11%

DEMOGRAPHICS

Please fill out the following details to let us know a little bit about you:

How old are you?

Gender

☐ Female
☐ Male

Race/ethnicity

White British

✓ White British

White (other)

Indian

Pakistani

Mixed race

Black Caribbean

Black (others)

Chinese

Other Asian (non-Chinese)

Other

What is your current marital status?

Single, Never Married

✓ Single, Never Married

Married

In a relationship

Separated

Divorced

Widowed

How would you describe your current employment status?

Full-Time Employee

✓ Full-Time Employee

Part-Time Employee

Self Employed

Student

Currently Unemployed

Family Caregiver

Retired

Please indicate the highest level of education you have completed:

GCSE

✓ GCSE

A level

Bachelor's degree

Graduate degree

None of the above

Have you ever sought help for emotional or mental health difficulties?
If so, please select the option(s) that best describes the difficulties you experienced:

- ☐ No, I have never sought help for any emotional or mental health difficulties
- ☐ Depression
- ☐ Bipolar Disorder
- ☐ Other mood disorder
- ☐ Bereavement
- ☐ Anxiety
- ☐ Substance use disorder
- ☐ Eating Disorder
- ☐ Psychosis
- ☐ Would rather not say
- ☐ Don't know
- ☐ Other

Next

Is this difficulty (or difficulties) ongoing?

- ☐ Yes
- ☐ No

Do you take any prescribed medication?

- ☐ No, I do not take any prescribed medication
- ☐ Antidepressants/mood stabilizers
- ☐ Anxiety medication
- ☐ Antipsychotic medication
- ☐ Other medication for mental health
- ☐ Contraceptive
- ☐ Other medication for physical health

Have you ever been diagnosed with any mental disorder?

- ☐ No, I have not been diagnosed with any mental disorder
- ☐ Depression
- ☐ Bipolar disorder
- ☐ Other mood disorder
- ☐ Anxiety
- ☐ Substance use disorder
- ☐ Eating disorder
- ☐ Psychosis
- ☐ Would rather not say
- ☐ Other

Next